# FOREST MANAGEMENT PLAN

**FOR THE**

# CITY OF HARRISONBURG

# DRY RIVER PROPERTY

**LOCATED IN THE RAWLEY SPRINGS AREA OF**

**ROCKINGHAM COUNTY, VIRGINIA**

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## PROPERTY LOCATION & DESCRIPTION:

The property is located in the Central and Ashby Magisterial Districts of Rockingham County, northwest of Rawley Springs, along Dry River and two of its principal tributaries, Dry Run and Skidmore Fork. It was acquired by the City for use as a municipal water source. Two water reservoir/flood control impoundments, Dry Run Lake, and Switzer Lake, are located on the property. City facilities located on the property include; the water intake station, Riven Rock Park, the police firing range and a communication tower. Route 33 adjoins or traverses the property from Riven Rock Park to the lower slope of Shenandoah Mountain. The property is estimated to contain 1,450 acres; of which 1,288 acres is forested, and 162 acres is non-forested. The non-forested acreage includes the two lakes and associated dam structures, and the sections of wide rocky flood-carved channels along Dry River. Around 1,126 acres are located in the bottom lands along Dry River, Dry Run and Skidmore Fork, and 324 acres are located on adjacent mountain slopes. Elevations range from about 1,660 feet at Riven Rock Park to 3,000 feet above the communication tower.

## WATERSHED DESCRIPTION:

The section of the Dry River watershed located above the City water intake station, which includes most of the property, is almost entirely forested, and is situated largely on steep to very steep mountain slopes. Elevations range from about 1,680 feet at the water intake station to about 4,340 feet at the top of Bother Knob. It encompasses an area of almost 55 square miles, or around 35,000 acres. Approximately 89 % of this acreage is owned by the U. S. Forest Service, 7 % is owned by private individuals or groups, and 4 % is owned by the City. The U. S. Forest Service acreage is largely being managed for purposes other than timber production and includes remote back country areas, botanical & zoological areas, Little Laurel Run Research Natural area, Shenandoah Mountain Crest - Cow Knob Salamander area, and scenic corridor & view shed areas. There are some areas in the overall management of this section of the Dry River watershed where the City can have a great influence and others where it can only have minimal influence. City property may contain just a small portion of the acreage in this section of the Dry River watershed, but it is perhaps the most important acreage as far as protecting the quality of water flowing from the area.

## MANAGEMENT OBJECTIVES:

The City is interested in implementing a forest management plan for the property directed primarily at the long term protection and enhancement of the quality of water arriving at the water intake station; secondarily, at promoting plant and animal species diversity, improving the quality of fishing, hunting and recreational opportunities for the public, and possibly, generating some level of periodic timber revenue.

The key factor to achieving most of these objectives for the long term is to maintain a healthy, vigorous forest cover on the property. This can be accomplished, over time, through the application of a variety of silvicultural practices designed to vary forest stand structure and

species composition, as part of an active and continuous forest management program. The result of this program will be a more "natural" forest having multiple vegetative layers (upper canopy, mid canopy, sub canopy, herbaceous), trees of varied sizes and ages, and a diverse plant and animal population. The recommendations made in this plan will help the City achieve its objectives for the property.

## LAND ACQUISITION & CHANGES IN OWNERSHIP:

Land purchases began in 1897 and continued through 1977. In all, twelve purchases have been made, totaling some 1,960 +/- acres. Over the years, this acreage has been reduced as land has been sold (Lennig - 47 +/- acres, Commonwealth of Virginia - 24 +/- acres), exchanged (U. S. Forest Service - 278 +/- acres), or condemned (U. S. Forest Service - 62 +/- acres & 36 +/- acres, a portion of the Cooper Tract to which the J. E. Roller Estate apparently had a superior title claim), leaving about 1,513 acres. The survey information available (from city records, county records, & U. S. Forest Service records) indicates that this acreage figure is probably a bit high and, for the purposes of this Forest Management Plan, the property will be estimated to contain 1,450 acres.

### PURCHASES:

| DATE | GRANTOR | DEED BOOK | ACREAGE |
|---|---|---|---|
| August 1897 | Joseph | 57/181 | 14.74 |
| June 1900 | Newman | 63/471 | 80 |
| June 1909 | Sipe & Harris | 86/478 | 287 |
| August 1909 | Sipe | 86/476 | 765 |
| May 1925 | Lennig | 132/418 | 25 |
| June 1925 | Cooper | 133/128 | 323 |
| February 1934 | Lennig | 156/563 | 10.50 |
| April 1940 | Hartman | 179/554 | 20.858 |
| July 1940 | Newman | 180/544 | 353 |
| December 1957 | Ralston | 263/513 | 15.4 |
| May 1967 | Brunk | 350/357 | 13.758 |
| August 1974 | Liskey | 441/311 | 52.09 |

### OUT CONVEYANCES OR REDUCTIONS IN ACREAGE:

| DATE | GRANTEE | DEED BOOK | ACREAGE |
|---|---|---|---|
| May 1925 | Lennig | 132/145 | 47.37 |
| January 1934 | Comm. of Va. | 156/349 | 24.07 |
| August 1957 | U.S.A | 169/329 | 107.2 |
| August 1970 | U.S.A. | 382/531 | 277.86 |

Questions of ownership still unanswered at this time; 1) the location and current ownership status of an 8 acre tract purchased from Dr. Ralston on Yellow Springs Mountain, 2) current ownership status of a 3 acre tract located to the right of the entrance road to Riven Rock Park on both sides of Route 33.

## BOUNDARIES:

The property is long and narrow in configuration, has considerable frontage on U. S. Route 33 and has a large amount of boundary line in proportion to its acreage. There are approximately 25 miles of boundary line; of which 16 miles are with the U. S. Forest Service, 8 miles are along Route 33 (5 miles - one side, 1.5 miles - 2 sides) and 1 mile is with private land owners. It has been a long time since the boundary lines with the U. S. Forest Service were surveyed and over the years, as marked boundary trees have died, it has become difficult to find some of these lines. Many of these lines are not being maintained by the U. S. Forest Service any longer. With a concerted effort, most of these lines can probably still be found, but some may need to be reestablished by survey. In 1934 the city sold a strip of land to the Commonwealth of Virginia so that Route 33 could be relocated. This strip of land is of varying width and in some areas gets considerably wider than the actual developed portion of the road way. Trees growing along the edge of this road way may actually be on this strip of land and not on City property. Some boundary monumentation was observed along this road way. Most of the boundaries with adjoining private properties have recently been re-surveyed and should be relatively easy to locate.

## ACCESSIBILITY:

There are many miles of actual road frontage on Route 33, and most of this frontage is on long straight sections of road with excellent sight distance. There are many areas where one can pretty much drive off this road and into the property wherever they desire. This has allowed the public easy entry into the property for a whole host of uses, some of which are compatible, and some of which are not really compatible, with the property being a municipal water source.

The Virginia Department of Highways maintains many vehicle "pull-off" sites along Route 33 that provide the public parking areas for walking access into the property. Some of these are well located, and some are located too close to water courses. Many trucks crossing over the Shenandoah Mountain stop for extended periods at some of these "pull-offs" sites.

Sections of the original road through the area, the Pendleton Turnpike, lie outside of the current right of way for Route 33. The Virginia Department of Transportation maintains some sections this old road as pull offs and uses one, on the U. S. Forest Service side of Route 33, for disposing of debris materials generated from road maintenance activities. Other sections of this road are currently being used by the City and the U. S. Forest Service, or are abandoned. It is possible that the Commonwealth of Virginia may still own this right of way.

Dry River winds its way through much of the property, sometimes being next to Route 33, sometimes being next to the base of the mountain, and sometimes being somewhere in-between. In places it flows in a single large channel, and in others it flows in many smaller separated channels, a braided channel. Rocky Run, Kephart Run, Hopkins Run, Peach Run, Dry Run, Skidmore Fork and several smaller unnamed streams further divide the property. All of this water, moving in so many directions, in so many different places, makes it a challenge to

properly access some areas of the property. It is important to note that these water courses are not always located where they are shown on the topographic maps.

Switzer Lake Road, Skidmore Fork Road, Firing Range Road, Dry Run Road, Riven Rock Park Road, and Rocky Run Road are the principal access routes into the property. Access is being controlled, or can be controlled, on most of these roads. There are also miles and miles of interconnecting "off road vehicle" trails throughout much of the bottom land area of the property. Access to these trails is uncontrolled and they receive heavy, year round use by the public. Several of these trails cross over or run directly in Dry River.

## SOILS:

Most of the soils found on most of the property are fairly good for growing timber. The best growing conditions on the property are found on sites in the bottom land areas, and on sites on the lower slopes, north and east facing slopes, benches and coves in the mountain areas. The worst growing conditions on the property are found on ridges and on south and west facing slopes in the mountain areas.

The Natural Resource Conservation Service soil survey maps indicate that there are soils of three major soil groups on the property. They are;

| Map Unit Symbol | Map Unit Name | Erosion Hazard | Equipment Limitation | Site Index (N. Red Oak) |
|---|---|---|---|---|
| 44 E | Lehew, Dekalb & Calvin Soils, 25 - 45 % slopes, very stony | Slight | Moderate | Lehew soils - north aspect 67, south aspect 58<br>Dekalb soils - north aspect 62, south aspect 53<br>Calvin Soils - north aspect 77, south aspect 67 |
| | * unit consists of steep, well drained soils on long side slopes in the Appalachian Mountains; low available water capacity, low natural fertility, low organic matter content, moderately well suited for trees, potential productivity is moderately high | | | |
| 44 F | Lehew, Dekalb & Calvin Soils, 45 - 65 % slopes, very stony | Moderate | Severe | Lehew soils - north aspect 67, south aspect 58<br>Dekalb soils - north aspect 76, south aspect 66<br>Calvin soils - north aspect 77, south aspect 67 |
| | * unit consists of steep, well drained soils on long side slopes in the Appalachian Mountains; low available water capacity, low natural fertility, low organic matter content, moderately well suited for trees, potential productivity is moderately high | | | |
| 70 A | Typic Udorthents, nearly level | * Information not provided * | | |
| | * unit consists of deep, well drained soils, on flood plains adjacent to small streams; low natural fertility, low organic matter content, slow runoff, occasionally flooded | | | |

A map unit represents an area dominated by one or more major soil types or an area having a variety of soil types. A map unit is identified and named according to the taxonomic classification of the dominant soils. The dominant soils in map units 44 E and 44 F are; Lehew and similar soils (30 percent), Dekalb and similar soils (25 percent), and Calvin and similar soils (20 percent).

Erosion hazard ratings indicate the risk of soil loss in a well managed forest; Slight = small expected soil loss, Moderate = measures are needed to control erosion during logging and road construction. Equipment limitation ratings reflect the characteristics and conditions of soils

that restrict the use of equipment needed in timber harvesting or forest management; Moderate = short seasonal limitation or a need for some modification in management or equipment, Severe = seasonal limitation, a need for special management or equipment or hazard in the use of equipment.

Site index is a term used by foresters to rate the growing potential of forest sites. The site index number is actually just the height that a tree of a given species can be expected to attain on a particular forest site by age 50. For example, if a tree grows 50 feet tall in 50 years, the site index for that tree species on that forest site is 50; if it grows 100 feet tall in 50 years, the site index for that tree species on that forest site is 100. The higher the site index, the more productive the forest site. Site index closely related to available soil nutrients, available soil moisture and slope/aspect. Generally, the better timber growing sites are in bottoms, hollows, and on north and east facing slopes, while the poorer timber growing sites are on the ridges and south and west facing slopes.

## WILDLIFE & FISHERY MANAGEMENT:

Wildlife diversity is often a function of plant diversity. More wildlife species are found in forest habitats that have a wide range of plant species of varying ages, sizes, and mixes, situated in a variety of spatial configurations. Manipulating forest vegetation can improve wildlife diversity.

The forests on the property are quite uniform. In the bottom land area, there are a wide variety of tree species present, but just three, white pine, yellow poplar, and hemlock, predominate. Except for the area along Skidmore Fork harvested last year, there is little change in either horizontal or vertical stand structure over this entire area. From one end of the property to the other, the bottom land forest is fairly consistent as far as species composition, tree age, and size, and the presence of a heavy upper canopy, and the lack of an understory. This forest is consistent enough to be considered a single forest stand. In the mountain land area, there are a smaller variety of tree species present. Oaks are predominant in some areas and pines in other areas. Forest stands of pole to small saw timber size oak, large saw timber size oak, pole size yellow pine, and small to large saw timber size cove hardwoods are found in this area. There is little change in vertical stand structure from one forest stand to the next.

Wildlife diversity can be enhanced on the property by manipulating forest vegetation through various silvicultural practices that will create a wider variety of forest habitats than presently exist. Practicing good forest management, controlling public use, controlling deer populations, and creating conditions appropriate for a wide variety of plant species is the best assurance of providing the varied habitats needed by a wide variety of wildlife species. The biggest mistake made in habitat management is the practice of "doing nothing". Cooperative efforts between the landowners in the upper Dry River watershed will be needed to have much of an impact on the populations of some wildlife species.

The Virginia Department of Game and Inland Fisheries manage the Switzer Lake, the Dry Run Lake and the Dry River fisheries on the property. The potential of any planned forest management activity having a negative impact on the Switzer Lake and Dry Run Lake fisheries is minimal, but if poorly planned, implemented and controlled, could possibly harm the Dry River fishery.

The Dry River is a native brook trout fishery. Brook trout require cold, silt-free, well oxygenated water having a relatively stable flow rate and abundant over head cover. Research has shown that summer stream temperature is the single most important factor in determining where brook trout can live and how productive they can be. Temperatures in the range of 55 to 65 degrees Fahrenheit are thought to be optimal. Silt on stream bottoms interferes with brook trout reproduction. Trout lay their eggs on the stream bottom and a clean, silt-free gravel substrate is needed to insure that a constant flow of well oxygenated water passes over them. It has been documented that as little as 1/4 inch of silt over trout eggs can result in 100 % mortality. Stability of flow rates in Dry River has been made possible by construction of the lakes and the City using the river as an everyday water source. Over head cover is provided by undercut banks, large rocks & ledges and large woody debris. In our area, most of the loss of

brook trout habitat has been caused by increased stream temperatures, siltation and altering stream channels. Stream water temperatures and habitat can be maintained during timber harvesting by leaving forested buffer strips along streams. The wider buffer strip recommended for trout streams and municipal water sources is more effective in limiting sedimentation, maintaining desired water temperatures, and providing food. It has been shown that vegetation along forested streams provides 90 % of its available food source.

A big concern in writing this forest management plan is that no forestry activity ever be undertaken that would end up being detrimental to water quality or these fisheries. Protecting water quality and these fisheries should always be at the forefront in any decision making regarding the forest resources on the property.

## THREATENED AND ENDANGERED SPECIES RECOGNITION:

When planning and/or undertaking forest management activities, one must always consider that there may be "Threatened or Endangered" species of plants and animals that are on the property. It is advisable to limit or curtail most forest management activities in areas in close proximity to known habitat of "Threatened or Endangered" species. Lists of plant and animal species that are considered "Threatened or Endangered" are maintained on a national level by the U. S. Fish and Wildlife Service and on a state level by the Virginia Department of Game & Inland Fisheries and the Department of Conservation and Recreation (Natural Heritage Program). A search by the Natural Heritage Program indicates that no listed species, on the national or state level, are known to occur within a two mile radius of the property. However, there are five species, of concern in Virginia, that are found in the general area, they are:

| COMMON NAME | SCIENTIFIC NAME | STATUS |
|---|---|---|
| Red Crossbill | Loxia curvirostra | G5 - S1 - SC |
| Mountain Paper Birch | Betula cordifolia | G5T5 - S1 |
| Pearly Everlasting | Anaphalis margaritacea | G5 - S1 |
| Cow Knob Salamander | Plethodon punctatus | G3 - S2 - SC |
| Nodding Pogonia | Triphora trianthophora | G3G4 - S1 |

* STATUS: The "G" number indicates the global rank assigned to designate how rare a species is based on factors occurring over its entire range; G3 = Vulnerable - moderate risk of extinction due to limited range, low population, recent decline in population, or other factors, G4 = Apparently Severe - uncommon species, but not rare, long term concern due to decline in population, or other factors, G5 = Secure - common, widespread, abundant species, G_T_ = signifies the rank of a subspecies or variety. The "S" number indicates the state rank assigned to designate how rare a species is based only on those factors occurring within Virginia; S1 = Critically impaired - very high risk of losing the species in the state due to extreme rarity, steep declines in population, or other factors, S2 = Imperiled - high risk of losing the species in the state

due to very restricted range, very few populations, recent declines in population, or other factors, SC = state candidate for listing.

* Information on these five species can be found on the Virginia Department of Game & Inland Fisheries website.

Only one of these species, the Nodding Pogonia, has actually been found on the property (see map on the next page). It is probably a good idea to have the Natural Heritage Program conduct a survey of the property to determine the extent of this species, and the presence of any of the other four species and to get their input into the management of the areas where any of these species are found.

## RECREATION:

The public uses the property for a wide variety of recreational activities, some of these are; hiking, bird watching, nature walking, dog walking, picnicking, swimming, camping, partying, fishing, hunting, off road vehicle trail riding, firewood cutting, and trash dumping. Most of these activities are appropriate uses for the property and should be encouraged. Some of these activities; such as off road vehicle trail riding, swimming, camping, and trash dumping are or may be inappropriate because of environmental or public health concerns, and potential impacts on water quality. The City needs to get control over these activities; either restricting them to non-sensitive areas or prohibiting them altogether. The majority of publications reviewed consider it very important to limit human activity in or around a municipal water supply. There are rules prohibiting swimming and camping at Switzer Lake, but it appears that they may not be enforced on a routine or consistent basis. There are many heavily used camp sites, mainly in areas where the public has vehicular access into the property, and most of these sites are located directly along a water course. The City is effectively controlling public use on some areas of the property by restricting vehicular access; locked gates on Skidmore Fork Road, Firing Range Road, and Riven Rock Park Road.

## CULTURAL FEATURES:

Cultural features observed while walking the property for the forest inventory were the remnants of the old "Pendleton Turnpike" roadway located along the north side of Dry river, old stone walls located northwest of Riven Rock Park, numerous old wire fences located throughout much of the bottom land area, an old foundation located near the beginning of Skidmore Fork Road, the old City "water intake" located on Rocky Run, the cabin located above the police firing range, and the cabin located in Riven Rock Park.

## FORESTRY & FOREST MANAGEMENT:

Forests are constantly changing, and while these changes may be small on a day to day or season to season basis, from year to year these changes add up and over time can be rather dramatic. Some of these changes are caused by internal factors associated with the normal biological processes and interactions occurring in local plant and animal communities, and some are caused by external factors; some of which are natural, such as drought, windstorms, and fires, and some of which are a result of human activity, such as exotic pests, pollution, and climate change. Some of these changes are good for the forest, and others are not so good. Needless to say, the forests on the property are going to change regardless of whether they are managed or not. Active and continuous management of these forests will help ensure that they will change in ways that foster the City's long term objectives for the property.

Over the years the focus of forest management has changed from one of timber production to one of sustaining the long term productivity of the forest by protecting water quality, soil quality and maintaining species diversity. Forests are very complex biological systems and the knowledge of all the interactions occurring within them, necessary for making "100 % correct" forest management decision, is often lacking, incomplete, or inaccurate. Working in this world of uncertainty, it is best for a forest manager to be cautious and use only silvicultural treatments that involve small scale manipulations of forest vegetation to create environmental conditions necessary for the growth and development of the tree species desired in the effort to maintain or enhance species diversity.

Silvicultural treatments that mimic natural disturbances can be used to create the forest stand structures needed to achieve the City's objectives. Treatments that promote a diverse plant species mix and a variety of stand structures are more likely to create a forest that can support diverse vegetative and wildlife populations. Species composition is one of the most important factors determining forest productivity and the benefits that a forest can provide. A more diverse species composition can be maintained in a forest when sizable canopy openings are created during timber harvesting. Canopy openings of 1/2 acre (170 feet diameter) have been shown to provide sunlight conditions suitable for the development and growth of most shade intolerant tree species growing in the area. Single tree and Group selection are uneven-aged regeneration methods that can be used, either separately or together, depending on specific site conditions, to produce a forest having a more diverse mix of species and stand structures and that, over time, will convert this forest into a more "natural" forest.

## FOREST INVENTORY:

The trees on the property were inventoried using a variable plot sampling method (prism cruise). 356 sample plots were located systematically, on a grid pattern (5 chain by 7 chain spacing), over the entire forested area of the property. Each plot was visited and information was recorded pertaining to the present condition of the forest, such as; species composition, stocking, regeneration, tree diameter and height, tree growth, impacts of other uses on the forest, environmentally sensitive areas, wildlife capabilities, harvesting possibilities, and presence of threatened or endangered species. The sampling intensity used in this timber inventory is

sufficient for planning purposes only, and not for selling timber. Estimated saw timber and pulpwood volumes for the property are;

**ESTIMATED SAW TIMBER VOLUMES BY SPECIES & DIAMETER CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)**

| DBH | WH. PINE | YEL. POPLAR | HEMLOCK | RD. OAK | WH. OAK | SYCAMORE | HD. MAPLE |
|---|---|---|---|---|---|---|---|
| 14 | 256,487 | 143,101 | 160,533 | 22,761 | 41,833 | 42,605 | 47,230 |
| 16 | 482,266 | 246,492 | 192,372 | 47,652 | 70,216 | 103,624 | 39,849 |
| 18 | 610,496 | 368,195 | 208,760 | 67,876 | 85,684 | 108,508 | 62,294 |
| 20 | 743,233 | 398,514 | 155,202 | 114,954 | 62,057 | 83,344 | 65,365 |
| 22 | 816,321 | 513,044 | 85,486 | 116,071 | 113,992 | 71,521 | 33,613 |
| 24 | 842,955 | 513,443 | 52,433 | 84,798 | 54,944 | 26,308 | 17,150 |
| 26 | 753,420 | 414,191 | 26,874 | 55,635 | 38,838 | 10,191 | 9,906 |
| 28 | 700,556 | 322,387 | 18,991 | 60,353 | 3,702 | 6,221 | 38,606 |
| 30 + | 699,567 | 310,958 | 17,568 | 58,121 | 22,075 | 5,312 | 31,997 |
| **TOTAL** | **5,905,301** | **3,230,325** | **918,219** | **628,221** | **493,341** | **457,634** | **346,010** |

| DBH | CH. OAK | HICKORY | SFT. MAPLE | BASSWOOD | YEL. PINE | BL. OAK | CUCUMBER |
|---|---|---|---|---|---|---|---|
| 14 | 25,399 | 67,191 | 31,137 | 34,072 | 58,430 | 31,496 | 11,103 |
| 16 | 53,579 | 56,449 | 57,659 | 45,592 | 56,572 | 25,607 | 13,109 |
| 18 | 96,960 | 98,440 | 55,952 | 39,879 | 48,469 | 42,336 | 23,233 |
| 20 | 43,301 | 13,184 | 32,135 | 28,882 | 17,152 | 17,931 | 10,911 |
| 22 | 35,754 | 34,721 | 21,664 | 23,530 | 0 | 3,840 | 25,332 |
| 24 | 34,596 | 0 | 7,730 | 8,495 | 0 | 6,390 | 4,559 |
| 26 | 21,969 | 5,109 | 0 | 10,947 | 0 | 0 | 5,368 |
| 28 | 4,257 | 0 | 0 | 0 | 0 | 7,796 | 6,915 |
| 30 + | 14,756 | 0 | 0 | 0 | 0 | 10,804 | 11,737 |
| **TOTAL** | **330,571** | **275,094** | **206,277** | **191,397** | **180,623** | **146,200** | **112,267** |

| DBH | WH. ASH | SCLT. OAK | BL. BIRCH | BEECH | MISC. HWDS. | TOTAL |
|---|---|---|---|---|---|---|
| 14 | 5,563 | 15,666 | 14,612 | 0 | 3,420 | **1,012,639** |
| 16 | 22,155 | 36,673 | 15,923 | 4,204 | 7,479 | **1,577,472** |
| 18 | 12,208 | 17,124 | 13,443 | 18,389 | 7,427 | **1,985,673** |
| 20 | 27,375 | 14,742 | 0 | 16,044 | 8,927 | **1,853,253** |
| 22 | 17,846 | 4,266 | 10,999 | 3,465 | 0 | **1,931,465** |
| 24 | 17,042 | 0 | 0 | 0 | 0 | **1,670,843** |
| 26 | 0 | 4,541 | 0 | 2,820 | 0 | **1,359,809** |
| 28 | 3,564 | 0 | 0 | 0 | 0 | **1,173,348** |
| 30 + | 4,750 | 0 | 0 | 0 | 0 | **1,187,645** |
| **TOTAL** | **110,503** | **93,012** | **54,977** | **44,922** | **27,253** | **13,752,147** |

**ESTIMATED PULPWOOD VOLUMES BY SPECIES: (IN WEIGHT CORDS)**

| SPECIES | TOTAL VOLUME |
|---|---|
| WH. PINE | 1,761 |
| YEL. POPLAR | 971 |
| HEMLOCK | 2,286 |
| RD. OAK | 248 |
| WH. OAK | 321 |
| SYCAMORE | 800 |
| CH. OAK | 1,363 |
| HD. MAPLE | 740 |
| HICKORY | 855 |
| SFT. MAPLE | 1,001 |
| BASSWOOD | 143 |
| YEL. PINE | 877 |
| BL. OAK | 211 |
| CUCUMBER | 97 |
| WH. ASH | 87 |
| SCLT. OAK | 224 |
| BL. BIRCH | 792 |
| BEECH | 101 |
| MISC. HWDS. | 512 |
| **TOTAL** | **13,390** |

* MISC. HWDS. INCLUDES BL. GUM, BL. LOCUST, SASSAFRAS, BL. CHERRY, BUTTERNUT, SOURWOOD, AMERICAN HORNBEAM & HOPHORNBEAM.

* YEL. PINE INCLUDES VA. PINE, PITCH PINE & EASTERN RED CEDAR.

For the purposes of this forest management plan, the property was divided into twelve management units, based on physical features; roads, creeks, bottom land, and mountain land. Detailed timber inventory information for each can be found later in the plan in tab sections devoted entirely to a specific management unit.

Trees were divided into five size classes; large saw timber, small saw timber, pole timber, sapling and established regeneration. Large saw timber trees are those measuring 17.0 inches and larger in diameter at breast height. Small saw timber trees are those measuring from 13.0 inches to less than 17.0 inches in diameter at breast height. Pole timber trees are those measuring from 5.0 inches to less than 13.0 inches in diameter at breast height. Sapling trees are those measuring from 1.0 inches to less than 5.0 inches in diameter at breast height. Established regeneration are trees having a root collar diameter of at least 1/2 inch in diameter to those having a diameter at breast height of less than 1.0 inch.

Trees in the large saw timber class are typically the ones considered for harvesting. They have the most economic value and, depending on the species, are readily marketable to area saw mills. Trees in the small saw timber class can be harvested for saw timber, but they are not as valuable as the large saw timber trees. Trees in the pole timber class, depending on the species, are harvested for pulpwood, fence posts or rails, and fire wood. Trees in the small saw timber class and pole timber class are usually not considered for harvesting unless there are health concerns, growing space concerns or practicing even aged forest management (clear cutting).

Trees in the sapling class and the established regeneration class are the trees most likely to become a part of the next stand when larger trees are harvested.

## THE PRESENT FOREST:

Many of the forest stands on the property appear to be of even age origin, probably developing after changes in land use or after natural disturbances. Traces of wire fencing and stone walls were observed in most of the bottom land areas while inventorying the timber, which indicates that cattle grazing occurred in these areas in the past. Grazing either stopped prior to, or around the time the City acquired each of the tracts that make up the property, allowing the present forest stands to become established.

The trees in most forest stands are about the same age, but often vary widely in size (diameter and height), particularly between species, but sometimes, between trees of the same species. White pine and yellow poplar trees are much larger than the other trees growing in the bottom land forest stands on the property. The conditions in which these forest stands became established, possibly pasture, or possibly a pasture/open woodland mix, favored these two tree species, allowing them to quickly get ahead of and then out competing other tree species. Factors that effect tree growth, such as soil nutrients, soil moisture, soil depth, aspect, available sunlight, can vary dramatically over fairly short distances, particularly in the mountain land forest stands, and these can contribute to size variations between trees of similar age.

The only evidence of past commercial logging activity was observed in Riven Rock Park and the Skidmore Fork area (recent salvage harvest resulting from wind storm damage). There are substantial volumes of merchantable timber on the property. Saw timber volumes average over 10,000 board feet per acre and pulpwood volumes average over 10 cords per acre. The volume of timber per acre on this property far exceeds that normally found in the area. An average saw timber sale in the area might contain only 40 to 50 percent of this volume per acre.

There are around 964 acres of bottom land forest stands and 324 acres of mountain land forest stands on the property. Considerable differences in stocking, species composition, volume and size exist between the forest stands found in these two areas. Most of the bottom land forest stands are over stocked, averaging 295 trees and 137 square feet of basal area per acre. These forest stands contain primarily mature large diameter saw timber trees, predominately white pine, yellow poplar and hemlock. Averaging about 13,000 board feet of saw timber and 10 cords of pulpwood per acre, these forest stands contain some of the highest volumes I have seen in the area. Many of the mountain land forest stands are moderately to fully stocked, averaging 402 trees and 96 square feet of basal area per acre. These forest stands generally contain smaller trees, primarily of small saw timber and pole timber size. Chestnut oak, white pine, white oak, red oak, and pitch pine are the predominant trees in these forest stands. Averaging about 4,000 board feet of saw timber and 11 cords of pulpwood per acre, these forest stands have fairly average volume levels for the area. The bottom land and mountain land forest stands contain similar numbers of pole timber size trees per acre and small saw timber size trees per acre, but differ widely on number of sapling size trees per acre and large saw timber trees per acre. The bottom land forest stands contain about one half the number of sapling size trees per acre and over twice the number of large saw timber size trees per acre found in the mountain land forest stands. The bottom land forest stands occupy the better timber growing sites and have more

large trees per acre, while the mountain land forest stands occupy the poorer timber growing sites and have more small trees per acre.

**COMPARING TREES PER ACRE AND DESIRED SPECIES PERCENTAGE BY SIZE CLASS ON BOTTOM LAND AND MOUNTAIN LAND FOREST STANDS**

| | BOTTOM LAND FOREST STANDS | | MOUNTAIN LAND FOREST STANDS | |
|---|---|---|---|---|
| SIZE CLASS | TREES/ACRE | DESIRED SPECIES | TREES/ACRE | DESIRED SPECIES |
| SAPLING | 134 | 35 % | 258 | 18 % |
| POLE TIMBER | 118 | 37 % | 117 | 46 % |
| SMALL SAW TIMBER | 19 | 60 % | 17 | 58 % |
| LARGE SAW TIMBER | 24 | 80 % | 10 | 84 % |
| TOTAL | 295 | 41 % | 402 | 29 % |

In both areas, the number of trees per acre of species that are normally desired for forestry and/or wildlife purposes were essentially the same, around 120 per acre. The low percentage of desirable tree species in the smaller size classes indicates, that in the event of a natural disturbance (wind storm, disease, insect) or unplanned regeneration activity, the next forest stand will probably be made up of mostly undesirable species.

There is a noticeable lack of regeneration present on the property. The timber inventory shows that, over the entire property, regeneration averages just 363 stems per acre, of which 40 percent is white pine, 24 percent is other desirable species and 36 percent is less desirable species. Only 36 sample plots of the 356 sample plots taken had more than 1,000 stems per acre. The lack of regeneration usually indicates over browsing by deer, competing vegetation or too little sunlight reaching the forest floor (heavy canopy cover). I have been told that deer were quite prevalent in the area in the past, but that their numbers seemed to have fallen off in recent years. Very few deer were observed for the amount of time spent on the property last winter and spring. Competing vegetation, namely mountain laurel, is very thick in several mountain land forest stands, but not in the bottom land forest stands. This leads me to believe that the lack of regeneration in these forest stands is probably due to too little sunlight reaching the forest floor.

Vegetative growth in both the bottom land and mountain land forest stands is not what it could be because of high tree stocking levels. The canopy is very dense and there is just no room for tree crowns to expand. Tree growth over the last ten years was measured in a sample of dominant and codominant white pine and yellow poplar trees found in management unit #2. White pine growth ranged from 1.1 inches to 1.7 inches and yellow poplar growth ranged from 1.1 inches to 2.0 inches over the period. Average white pine growth was only 50 percent and yellow poplar growth only 70 percent of what had been expected. The stand structure of most forest stands is too uniform for supporting the wide variety of forest species that are needed to achieve the management objectives for the property. Most trees are in the main canopy, some are in the mid canopy and few are in the lower canopy. Most forest stands are about the same age.

A more varied age structure between forest stands and within forest stands is needed to enhance species diversity.

Three unique forest stands on the property are located in management unit 4-B and 6-B. The first, located in management unit 4-B, lies in a steep rocky hollow, near a rock ledge with a small waterfall, in the southeastern portion of the unit. There is a mix of tree species, age classes and size classes, and areas of sunlight reaching the forest floor. This area may hold interesting recreational/interpretive opportunities. The second, located in management unit 6-B, contains mostly large saw timber size white oak trees. This forest stand lies on an elevated bench on the north side of Dry River in the southwest portion of the unit. This area may hold interesting wildlife management opportunities. The third, also located in management unit 6-B, contains saw timber size trees in a mixture of oak species. This forest stand lies on a bench and on the slopes around the communication tower in the northern portion of the unit. This area may also hold interesting wildlife management opportunities.

Thirty-two different tree species including eastern white pine, yellow poplar, eastern hemlock, northern red oak, white oak, mockernut hickory, bitternut hickory, red maple, sugar maple, chestnut oak, cucumber magnolia, American sycamore, American basswood, white ash, black birch, yellow birch, black oak, American beech, scarlet oak, black gum, black locust, black cherry, butternut, sourwood, sassafras, serviceberry, American hornbeam, hophornbeam, striped maple, pitch pine, Virginia pine and eastern red cedar were inventoried on the property.

## FOREST HEALTH ISSUES:

There are numerous insects and diseases that affect tree species present in the forest on the property. Some that are currently having or could potentially have a great impact on this forest are;

### HEMLOCK WOOLLY ADELGID - *Adelges tsugae*

The Hemlock Woolly Adelgid is a small aphid-like insect. A native of Asia, it was first observed in eastern Virginia in the early 1950's and has since spread to fifteen eastern states. Immature nymphs and adults damage hemlock trees by sucking sap from twigs, which causes the trees to prematurely lose their needles. Trees are known to have died after just a single defoliation. The long term ecological significance of this insect is enormous as it causes extensive mortality and decline of hemlock trees. No hemlock growing sites appear to be immune from the effects of this insect. Unless some usable control mechanism is discovered or developed in the near future, the devastation to hemlock caused by this insect may be similar to that of the chestnut blight on the American chestnut.

The Hemlock Woolly Adelgid has no known naturally occurring enemy to keep its population in check. There are currently no practical options available for its control in a forest setting. Research efforts into finding a control mechanism are ongoing, with the most promise being shown by the possible safe introduction of exotic predatory beetles. Hopefully, a solution can be found before all the hemlock trees are gone.

The hemlock is an ecologically important tree species, which is particularly true on this property. Many wildlife species rely on the tree for food, shelter and breeding sites. The tree grows primarily in riparian areas. Hemlocks have dense crowns that help moderate stream water temperatures and wide spreading root systems that help prevent stream bank erosion.

The hemlock, however, is not a particularly important timber species. It is used primarily in making rail fencing, paper and framing lumber. There is only a limited market for the tree and its value, in relation to other tree species, is relatively low.

There are any number of harvesting options available, depending on the management objectives for a particular area (which might include aesthetics, wildlife habitat, water quality protection, public safety, stand regeneration, timber revenue, other, or some combination) and the volume and size structure of hemlock present. The range of options is really a continuum from not harvesting any hemlock to harvesting all that can possibly be logged. There are good points and bad points to all the various options and the particular harvesting option chosen for one area may not be applicable in other areas. Whether or not any harvesting occurs on the property, most of the hemlock trees will probably die in the next 5 to 15 years. There are a number of different management situations on the property requiring multiple strategies for dealing with this insect pest. Salvaging some of the hemlock timber from some areas on the property will be beneficial so long as it can be done without negatively impacting water quality. Possible benefits include; the ability to speed up the forest transition process that is going to occur anyway, the ability to influence the composition, spacing, and structure of next forest stand, risk reduction (fire & public safety) and aesthetics.

The insect will have a significant impact in the bottom land management units, 1-A, 1-B, 2, 3, 4-A, 5-A, 6-A & 7-A, where hemlock accounts for about seven percent of the saw timber volume, twenty-two percent of the pulpwood volume, twenty-one percent of the trees and fourteen percent of the basal area. The management units of greatest concern, where hemlock occurs in its largest concentrations, accounting for the following percentages, are;

| Management Unit | Saw Timber Vol. | Pulpwood Vol. | # Trees | Basal Area |
|---|---|---|---|---|
| 1-A | 7 % | 39 % | 33 % | 19 % |
| 2 | 8 % | 24 % | 28 % | 16 % |
| 6-A | 7 % | 44 % | 43 % | 23 % |

Salvaging hemlock will not generate a large amount of revenue, but still should be strongly considered and acted on quickly, particularly in these three management units.

**GYPSY MOTH** - *Lymantria dispar*

The gypsy moth is another exotic pest that can potentially have a huge impact on some forest areas on the property. Ecological and socioeconomic impacts caused by the gypsy moth have been numerous and include; aesthetics, recreation, wildlife habitat, fish habitat, nutrient cycling, water quality, fire hazard, tree mortality, and vegetation changes.

The gypsy moth was introduced, inadvertently, into Massachusetts in 1869 and about 15 to 20 years ago spread to the Rockingham County area. It is an irruptive outbreak species, with populations peaks occurring every 8 to 11 years. The caterpillar stage feeds on the leaves of over 500 tree and shrub species, however, they prefer oak leaves, and most of the stress and mortality they have caused has been to oak species.

There are five essential steps in minimizing the impacts of the gypsy moth;

**1) Identify areas where severe impacts are likely to occur -** Severe defoliation and mortality are most likely to occur in stands having a high percentage of oak species. Generally, trees that are defoliated by gypsy moths will produce another set of leaves later on in the growing season, however, this places a heavy demand on stored food reserves and makes the tree more vulnerable to attack by other organism which adds significantly to tree mortality.

Guidelines have been developed for estimating the potential mortality that can be expected following consecutive years of defoliation. These guidelines are simply a rule of thumb and may not account for all the variation in tree mortality that occurs. Tree mortality is affected greatly by many interrelated factors; some of these are, frequency and intensity of defoliation, tree stress, actions of secondary organisms such as shoestring root rot and two-lined chestnut borer, influence of gypsy moth parasites and predators, effectiveness of control measures, and weather conditions. Each of these factors are in themselves hard to predict. Although these guidelines are not perfect, they do provide an indication as to where severe impacts are most likely to occur.

These guidelines are;

| % Oak in an Area | Hazard Rating | Potential Mortality |
|---|---|---|
| 50 % + | High | 25 % + |
| 21 - 49 % | Moderate | 11 - 24 % |
| 11 - 20 % | Low | 5 - 10 % |
| 0 - 10 % | Very Low | 0 - 4 % |

Using these guidelines, the various management units were assigned the following gypsy moth hazard ratings;

| Management Unit | Forested Acres | Hazard Rating | Potential Mortality |
|---|---|---|---|
| 1-A | 142 | Very Low | 0 - 4 % |
| 1-B | 9 | Low | 5 - 10 % |
| 2 | 127 | Very Low | 0 - 4 % |
| 3 | 233 | Very Low | 0 - 4 % |
| 4-A | 178 | Very Low | 0 - 4 % |
| 4-B | 68 | Moderate | 11 - 24 % |
| 5-A | 150 | Very Low | 0 - 4 % |
| 5-B | 37 | High | 25 % + |
| 6-A | 52 | Very Low | 0 - 4 % |
| 6-B | 157 | Moderate | 11 - 24 % |
| 7-A | 73 | Low | 5 - 10 % |
| 7-B | 62 | Moderate | 11 - 24 % |

**2) Determine when defoliating populations are present** - Gypsy moths are present on the property and it is possible that their population will increase in the future to a level where they will do significant damage in some areas. Populations at the following levels could seriously impact the management objectives for various areas of the property;

| Management Objective | Egg Masses/Acre |
|---|---|
| Recreation- Nuisance Prevention | 250 |
| Wildlife-Mast Production | 500 |
| Aesthetics | 650 |
| Timber | 1,200 |

Management units 4-B, 5-B, 6-B & 7-B, have moderate to high hazard ratings and need to be inspected each year for gypsy moth egg masses. If gypsy moth populations are increasing, sample plots should be taken to determine the average number of egg masses per acre. If the average number is 1,200 or more egg masses per acre, then moderate to heavy defoliation and subsequent tree mortality can be expected unless control measures are applied to the area.

**3) Spray to prevent heavy defoliation** - Spraying is rather expensive, but well worth the cost to protect high value saw log and veneer quality trees and areas where moderate to high tree mortality is expected.

**4) Use silviculture to minimize impacts** - Silvicultural treatments, that decrease the susceptibility to defoliation and strengthen trees against mortality, can be used in advance of infestations to minimize the impact of the gypsy moth. Tree crown condition and position have a lot to do with ability of a tree to survive repeated defoliations. Trees with poor crowns and/or suppressed crowns have much higher incidence of mortality than do trees with good crowns and/or dominant or co-dominate crowns. Thinnings and improvement cuttings will help improve crown condition and vigor of the trees in the residual stand, thus improving their ability to

withstand defoliation. Healthy trees are more likely to recover and survive defoliation and to resist attack by secondary organisms.

**5) <u>Salvage dead trees within two years</u>** - Despite precautions, if the gypsy moth is allowed to feed, some trees will die within one to three years of repeated defoliation. Salvaging dead trees can help reduce the economic loss. It is best to salvage trees within a year of when they die because they quickly lose value. Trees killed by gypsy moths are only usable as saw timber for only a couple of years and as pulpwood for about five years after they die. When these trees die they immediately lose any value they have for veneer and each year they lose ten to fifty percent of their value for saw timber due to drying checks, sapwood decay, stain and wood borer holes.

**<u>EMERALD ASH BORER</u>** - *Agrilus planipennis*

The emerald ash borer is a beetle native to eastern Asia that was first found in Michigan in 2002, and within the past few months in Virginia. The larvae of this beetle feeds by tunneling under the bark of otherwise healthy ash trees, eventually girdling and killing the trees. This beetle infests ash of all species and sizes, and causes 100 % mortality. There is no known mechanism of control for this pest. While ash is not present in large numbers on the property, only about 1,100 merchantable trees, and it is not a particularly important wildlife tree, it is important because it contributes to species diversity and has a relatively high saw timber value.

## HARVESTING TIMBER:

Harvesting timber, particularly in the bottom lands units, will be beneficial for the forest, wildlife, and the long term protection of water quality. In these areas, three tree species dominate, overcrowding exists in the upper canopy, tree growth is not what it should be, and there is a lack of tree regeneration in the understory. Harvesting timber will allow species composition to be manipulated; if the desire is to increase the presence of particular species, they can be favored (smaller proportion harvested); if the desire is to decrease the presence of particular species, they can be discriminated against (larger proportion harvested). Harvesting timber will open up the main canopy, stimulating growth in the residual forest stand, and providing conditions necessary for the establishment of new regeneration. Harvesting timber will create openings of varying sizes in the upper canopy which will provide the sunlight conditions necessary for the growth and development of a wide variety of tree species, both shade tolerant and shade intolerant, thus promoting species diversity.

One appropriate way to harvest this timber is a combination improvement, single tree selection, and group selection cut, creating a new forest stand from the combination of the best trees in the present forest stand, and trees of a new age class. In small areas, harvesting will be heavy (group selection openings), but overall, will be fairly light, and, over time, should approximate the tree growth expected to occur between planned timber harvests. The amount of timber designated for harvesting, both total volume and volume per acre, will need to be large enough to economically justify a logging operation. Most trees, however, will not be harvested, and will remain in the residual forest stand. The ability to effect positive changes in stand structure and species composition will be limited by the amount of hemlock present in a forest stand.

Any harvesting needs to be planned and carried out on the basis of sound forestry/environmental principles, and not for short term economic gain, which, unfortunately, is usually the reason for timber harvesting timber. An experienced, knowledgeable forester should be engaged to determine which trees to keep and which trees to harvest and to prepare, administer, and supervise timber sales. These bottom land areas are environmentally sensitive, requiring extra thought, and care to properly plan, and carry out successful harvesting operations. Timber buyers and loggers, by nature, are a very independent group of individuals, they are used to doing things their own way, and many, may not be willing, or capable of harvesting this timber in the manner in which it needs to be done. Harvesting timber can be accomplished successfully on the property, if both, the forester, and timber buyer/logger chosen have a true concern for the land.

## HARVESTING NEAR STREAMS, WETLANDS OR RIPARIAN AREAS:

Streams can be perennial and intermittent. Perennial streams flow in well defined channels, usually year round, but might possibly dry up in periods of extended drought. They are shown on USGS topographic maps as solid blue lines. Aquatic organisms are usually readily found in these streams. Intermittent streams flow in defined channels that show some evidence of scouring or bare soil, only on a seasonal basis, during periods of wet weather. Some are

shown on USGS topographic maps as short sections of blue lines connected with three blue dots. Some are not shown on these maps. Aquatic organisms are usually hard to find and are often not found in these streams.

Wetlands are low lying lands covered with shallow and sometimes temporary water or those with a water table near the surface for at least part of the year that support vegetation that normally grows only in saturated soil conditions; such as seeps and bogs. Wetlands vary greatly in the amount and type of vegetation present. Wetlands can be predominantly forested, occupied by shrubs and grasses or even have emergents or aquatic beds. There are over two hundred different species of birds, mammals, reptiles and amphibians in the Eastern United States that depend, to varying extents, on wetlands for habitat.

Riparian areas are the areas bordering springs, seeps, bogs, wetlands, streams, rivers and lakes. Forested riparian areas are used by a wide variety of wildlife, for some species it is permanent habitat, for some it is seasonal habitat and for some its just a travel route. These areas are critical for wildlife and for water quality protection.

When planning for timber harvesting, buffer strips, also called filter strips or stream management zones, along or around all of these areas must be located and marked for their protection. These strips filter sediment and nutrients, maintain desirable water temperatures, as well as providing many habitat elements for wildlife. Only minimal soil disturbance, and none if possible, should occur within these strips. The forest floor should be left essentially undisturbed. The width of these strips depend on the steepness of the slopes along or surrounding these areas and whether they are next to a trout stream or water supply/reservoir. In most situations, these buffer strips should be a minimum of fifty feet wide, but with trout streams and municipal water supply/reservoirs wider strips are needed for added protection of water quality. Buffer strips sixty feet to one hundred feet wide are needed along trout streams and one hundred to two hundred feet wide along or around municipal water supply/reservoir, depending again, on the steepness of ground next to the stream or water impoundment. Under current state guidelines, these strips can be managed for forestry purposes and up to 50 % of the basal area or 50 % of the canopy may be harvested in most situations. An exception is the situation where there is the need for a salvage or sanitation harvest. When there is a great threat to neighboring forests and there are no other control measures available that would lessen the environmental impact on the buffer strip, then more trees can be harvested from these areas. Small areas less than one acre can be clear cut. Provisions for revegetating or replanting should be made in these situations to reduce the time period during which there will be limited forest cover. While the above is permissible in certain situations, a more cautious treatment of the buffer strips on the property is warranted to protect the City water supply and the brook trout fishery in Dry River.

Any woody debris generated from harvesting is required to be removed from streams. The thinking here is that debris left in streams could change the normal flow of the stream, causing stream bank erosion and if green woody debris is left in streams in sufficient quantities it might cause the oxygen in the water to be depleted, resulting in a kill fish. Fisheries biologists would like some of the larger woody material left in the stream to provide cover, but this is not permitted.

## ROADS:

Road and trails contain a lot of exposed and compacted soil area which contributes to increased storm water run off and increased sediment getting into streams. Some roads and trails are a necessary for land management purposes, but their length should be kept to a minimum, their location well planned, and their use controlled. There are numerous roads and trails on the property, some are needed, but most are not, and could be closed out and reclaimed.

Some of the roads on the property are gated, and while sections of these roads could use some maintenance; most notably grading, graveling, seeding, culverts, additional water control structures, and improved stream crossings, overall they are in good condition. Other roads on the property are un-gated, and most of these are in poor condition.

## BEST MANAGEMENT PRACTICES:

The Virginia Department of Forestry has established guidelines, commonly referred to as Best Management Practices (BMPs), for forest land management and timber harvesting. These practices are common sense soil and water conservation measures that ensure the protection of water quality, aquatic habitat, and forest productivity. When these practices are followed, and skid trails, haul roads, and/or landing sites are well planned, and properly constructed, maintained, and closed out, the impacts of soil disturbing activities will be minimal. Best Management Practices incorporate six basic principals;

**PLAN THE JOB** - Time spent planning and laying out skid trails, haul roads, and landing sites will prevent future problems. Through careful planning, the length of skid trails, and haul roads, and the number of landing sites can be minimized, resulting in less soil disturbance, and less impact on water quality and aquatic habitat.

**STAY AWAY FROM STREAMS** - Try to build skid trails, haul roads, and landing sites at least 100 feet away from streams. Leave forested buffer strips along streams. Keep equipment out of streams and buffer strips. Minimize the number of stream crossings.

**USE CARE WHEN CROSSING STREAMS** - When a stream must be crossed, use a well-placed ford, bridge, or culvert. Cross streams at a right angle when possible. Stabilize disturbed soils around stream crossings. Gravel road bed at stream crossings.

**CONTROL WATER IN SMALL AMOUNTS** - Use ditches, culverts, broad-based dips, and grade breaks to handle water before its volume or velocity reaches the point where it can cause erosion damage.

**CLOSE OUT AFTER TIMBER HARVESTING** - Skid trails should be water-barred and seeded when no longer needed (also, when not used for extended periods during harvesting). Upon completion of harvesting; haul roads should be, checked to make sure that sufficient water control structures are in place (add more if needed), properly graded

(no ruts, out-sloped), and seeded (proper mix, applied at an adequate rate, mulched where needed); landing sites should be graded, have sufficient water control structures installed, and seeded. Success at obtaining a good vegetative cover, may require some amount of soil loosening, liming, fertilizing, or mulching. Wildlife food seed mixes or wild flower seed mixes may grow well along some sections of haul road and landing sites. Permanent wildlife food plots can be established on landing sites. Vehicular access should be blocked while getting vegetation established on these areas.

**ROUTINE MAINTENANCE** - Control access by installing locked gates to prevent damage to skid trails, haul roads, and landing sites. Regularly inspect and maintain water control structures, and stream crossing structures. Grade and seed roads when necessary. Maintain some kind of cover (vegetation, leaf, gravel) on these areas, particularly those near streams.

# GLOSSARY:

**ADVANCED REGENERATION** - Seedlings or saplings that are present in the understory prior to a cutting in the overstory.

**AGE CLASS** - A group of trees in a stand that are the same age or close to the same age.

**ARTIFICIAL REGENERATION** - Creating a new age class by artificial means; planting or seeding.

**BASAL AREA** - The cross-sectional area (usually in square feet) of all stems measured at breast height (see definition below) over a standard area of land (usually an acre). This is a means of expressing forest stocking; normal forest stocking ranges between 60 and 120 square feet of basal area.

**BEST MANAGEMENT PRACTICES** - Guidelines establishing standards for all aspects of timber harvesting that have been developed for the protection of water quality.

**BIOLOGICAL DIVERSITY** - The variety and abundance of all life forms in a particular place. Plants, animals and other living organisms and the processes, functions and structures that sustain that variety and allow it to adapt to changing circumstances.

**BOARD FOOT** - A unit of measurement of lumber, equivalent to a board 12 inches wide by 12 inches long by 1 inch thick, or 144 cubic inches.

**BOLE** - The stem or trunk of a tree, excluding its roots and top (crown). The part of the tree from which logs or pulpwood are cut.

**BREAST HEIGHT** - The standard height for measuring tree diameters in volume estimation, defined arbitrarily as 4 1/2 feet above ground level on the upper side of the tree.

**CANOPY** - A layer of foliage in a forest.

**CLEANING** - A release treatment made in an age class not past the sapling stage in order to free desired trees from less desirable trees of the same age class which overtop them or are or likely to overtop them.

**CLEAR CUT** - An even aged method of regenerating a forest stand through the removal of all trees larger than seedlings in a single cut. The new forest stand develops under full sunlight conditions.

**COMPETITION** - The constant demand of an organism for more growing space, light, nutrients and water.

**CONSERVATION** - The wise use of natural resources. The management of a resource which retains the basic character of that resource over time.

**CORD** - A unit of measurement for pulpwood and firewood, originally a volume measurement equal to 128 cubic feet of stacked wood (includes solid wood and voids), now an arbitrary defined weight measurement. For the purposes of this plan, a cord of hardwood pulpwood equals 5,400 pounds and a cord of softwood pulpwood equals 5,300 pounds.

**COVER** - Vegetation used by wildlife for protection from predators or weather conditions and to provide areas to reproduce.

**COVER TYPE** - The classification of a forest based on the presence of commonly recognizable combinations of tree species.

**CROP TREE** - Any tree that is selected to be a component of the future stand.

**CROWN CLASS** - A tree class, based on the crown position of a tree relative to the crowns of adjacent trees.

**DOMINANT** - Trees with crowns extending above the general level of the main canopy. These trees receive full sunlight from above and partly from the sides.

**CO-DOMINANT** - Trees with crowns forming the general level of the main canopy. These trees receive full sunlight from above, but little from the sides.

**INTERMEDIATE** - Trees with crowns extending in the lower portion of the main canopy. These trees receive little direct sunlight from above and none from the sides.

**OVERTOPPED or SUPPRESSED** - Trees with crowns that are under the crowns of adjacent trees. These trees receive little if any direct sunlight.

**CROWN COVER** - The ground area covered by the crowns of trees or woody vegetation as delineated by the vertical projection of crown perimeters; commonly expressed as a percentage.

**CROWN DENSITY** - The compactness, or depth of foliage of the crowns of trees and/or shrubs.

**CRUISE** - A survey of the forest to sample the quantity, size, species and quality of trees present, as well as to note terrain, soil conditions, drainage and other information relevant to forest management.

**CULL TREE** - A tree with 50% or more of its volume determined to be defective.

**CUTTING CYCLE** - The planned interval between partial harvests in an uneven-aged forest stand.

**DEFERMENT CUT** - A regeneration practice during which up to 20 % of the basal area of a forest stand is carefully selected for retention as part of the next forest stand. These trees will remain through the end of the next rotation. This practice creates a two-aged forest stand.

**DEN TREE** - Any tree with one or more cavities that afford shelter and protection to wildlife.

**DIAMETER AT BREAST HEIGHT** - Tree diameter, outside the bark, measured at breast height. The term is typically abbreviated as DBH.

**DIAMETER CLASS** - The grouping of trees of similar size. Two inch diameter classes were used in this management plan. For example, the 14 inch diameter class contains trees having diameters between 13.0 inches and 14.9 inches.

**ECOSYSTEM** - The natural complex of plant and animal populations and the particular set of physical conditions under which they exist.

**EDGE** - The place where plant communities meet.

**ENDANGERED SPECIES** - Any life form which is in danger of extinction throughout all or a significant portion of its range. Its population level is so low and/or its habitat is so degraded that immediate action must be taken to avoid the loss of the species.

**EVEN-AGED** - The description of a forest stand having trees of approximately the same age, usually less than 20 % of rotation. An even-aged forest stand normally has a simple vertical stand structure.

**EXOTIC SPECIES** - Any species growing or living outside its natural range of occurrence, nonnative or non-indiginous species.

**EXPOSURE** - The compass direction in which a slope faces.

**FAUNA** - Of or relating to animals, the animals of a specified region or time, a descriptive list of such animals.

**FLORA** - Of or relating to plants, the plants of a particular region or time, a descriptive list of such plants.

**FOREST ECOLOGY** - The interrelationships between the organisms in a forest community and the physical environment in which they exist.

**FOREST HEALTH** - A forest can be considered healthy when there is a balance between growth and mortality, and the forest has the resiliency to react and overcome various environmental stresses. Potential stresses include insects, pathogens, weather, climate, pollution and others.

**FOREST INVENTORY** - The gathering of information such as timber volume, area measurement, forest condition, growth and mortality for effective forest management planning.

**FOREST PRODUCTIVITY** - The ability of tree species to grow on a particular site; influenced by internal (tree physiology) and external (soil, water, climate) factors.

**FOREST RESOURCES** - Natural resources associated with forest ecosystems, including, but not limited to; air, water, soil, wildlife, fish, vegetation, recreation and aesthetics.

**FOREST STAND** - A section of forest having relatively uniform composition in regards to species, size structure and density and distinguishable from other stands because of these attributes. Nearly all silvicultural treatments are prescribed on the forest stand level.

**FOREST STAND COMPOSITION** - The proportion of each tree species in a forest stand expressed as a percentage of the total number, total basal area or total volume of all tree species in the forest stand.

**FOREST STAND PRESCRIPTIONS** - The written instructions prepared by a forester for planned management activities on a specific forest stand.

**FOREST STAND STRUCTURE** - The various horizontal and vertical physical elements of the forest stand. The complexity or arrangement of tree ages and size classes.

**FULLY STOCKED** - Any forest stand containing a combination of basal area and stems per acre sufficient to indicate optimal use of the available growing space.

**GROUP SELECTION** - An uneven-aged method of regenerating forest stands in which trees are removed and new age classes are established in small groups. The maximum size of the opening is approximately twice the height of the adjoining trees, but generally not more than 1/2 acre. These small openings provide site conditions suitable for regenerating most tree species, even shade intolerant species.

**HABITAT** - The specific combination of food, shelter and water that is required to accommodate a species.

**HABITAT DIVERSITY** - The number of different types of habitat within a given area.

**HABITAT FRAGMENTATION** - The breaking up of habitat into smaller isolated sections through the modification or conversion of habitat by various management activities.

**HARDWOOD** - A term applied to broad-leafed trees, many of whose wood is harder than the wood of most needle-leafed trees. The term is roughly equivalent to angiosperm and deciduous and is opposite of gymnosperm, evergreen and coniferous.

**IMPROVEMENT CUTTING** - A cutting made in a forest stand past the sapling stage primarily to improve species composition and tree quality by removing trees that are less desirable, poorly formed, damaged or unhealthy.

**INVASIVE SPECIES** - A species that rapidly populates new areas and displaces other species. Most invasive species are exotic species that have no natural control mechanisms (disease, predation and competition) to limit their spread.

**HARVEST** - The process of removing trees from a forest stand, a logging operation.

**HIGH-GRADING** - A timber cutting method which removes the highest quality, most economically desirable trees and leaves lower quality, less valuable trees to continue growing. Generally considered poor forestry, it returns quick profits at the expense of future forest productivity and gradually degrades the genetic resource of the forest.

**INTERMEDIATE TREATMENTS** - A collective term for any silvicultural treatment designed to enhance growth, vigor, quality and composition of a forest stand after regeneration has been established and before the final harvest.

**INTERMITTENT STREAMS** - Any water course which carries a visible flow of water periodically, usually depending on the season of the year, and current or recent weather conditions.

**LOW-GRADING** - The sound forestry practice in which lower value trees are removed during thinnings to release more promising crop trees.

**MAST** - Wild nuts, seeds and fruits which serve as food for wildlife.

**MATURE FOREST** - Generally used in an economic sense to indicate that a forest has attained harvest age.

**MBF** - The abbreviation for thousand board feet.

**MULTISTORIED** - Forest stands that contain trees of various heights and diameter classes and support foliage at various heights in the vertical profile of the forest stand.

**NATURAL REGENERATION** - A stand of trees created by natural means such as seeding or sprouting.

**OLD GROWTH FOREST** - A forest that contains a wide range of tree sizes and ages, a deep, multi-layered crown canopy, diverse vegetation, and significant dead woody debris including standing snags and fallen trees. They typically appear to be uneven-aged rather than even-aged.

**OVERSTORY** - The upper layer of foliage in a forest.

**PERENNIAL STREAM** - Any water course that carries a flow throughout the year.

**RARE** - Species that have a widespread distribution, but not in all areas. In these areas, local edaphic, topographic or biotic factors provide conditions that are unfavorable for the species or they are found in unusual habitats.

**REGENERATION** - Also called reproduction, refers to seedlings and young growth below pole size, or to the establishment of such growth. Harvests or regeneration cuttings have, as a principal objective, the establishment of adequate regeneration of desirable species.

**RELEASE** - A silvicultural treatment designed to free young trees from undesirable, usually overtopping, competing vegetation.

**RESIDUAL STAND** - The aggregate of trees remaining in a forest stand following a silvicultural treatment or natural disturbance.

**RIPARIAN AREA** - The area influenced by the presence of a concentration of water. Areas around springs, bogs, marshes, streams, ponds or lakes. It includes the water body and adjacent land areas.

**ROTATION** - The planned number of years between the regeneration of a forest stand and its final harvest.

**SALVAGE CUTTING** - The removal of dead trees or trees being damaged or killed by injurious agents, to recover value that would otherwise be lost.

**SAPLING** - A tree, usually young, that is larger than a seedling but smaller than a pole, generally between 1 inch and 4.9 inches in diameter at breast height.

**SAW TIMBER** - Trees normally over 13 " in diameter at breast height that can be sawn into boards. Sometimes further divided into small saw timber (13.0" - 16.9" DBH) and large saw timber (18.0" DBH & larger).

**SEDIMENTATION** - The process of depositing a solid after being transported by a liquid. The act or process of depositing soil particles onto the stream bed.

**SELECTIVE CUTTING** - A vague expression referring to thinnings or harvests that are not clear cuts. This has been applied to such a wide range of styles and intensities of cutting that it is best replaced by more specific terms, particularly because the expression has been applied to high -grading cuts to make them appear silviculturally sound. Do not confuse this term with single tree selection.

**SHADE INTOLERANT** - A description of a tree species whose seedlings are not capable of sustained development at low levels of sunlight.

**SHADE TOLERANT** - A description of a tree species whose seedlings are capable of development at low levels of sunlight.

**SHRUB** - A woody plant of relatively low height, distinguished from a tree by having multiple stems rather than a single stem.

**SHELTERWOOD SYSTEM** - A method of regenerating an even-aged forest stand in which a new age class is developed below the residual stand in a the partially shaded environment. The residual stand is removed in one or more succeeding harvests to fully release the new stand.

**SILVICULTURE** - The art and science of controlling the establishment, growth, composition, health and quality of forests. Silviculture involves manipulating forest vegetation to meet the diverse needs and values of landowners and society on a sustained basis.

**SILVICULTURAL SYSTEM** - A planned process whereby a forest stand is tended, harvested and reestablished. The system name is based on the number of age classes and/or regeneration method.

**SINGLE TREE SELECTION** - A method of creating new age classes in uneven-aged stands in which individual trees in all age classes are removed more or less uniformly throughout the stand to achieve desired stand structure characteristics. This method is used when the objective is to regenerate shade tolerant tree species.

**SITE INDEX** - A classification of site quality for a particular tree species, usually expressed in terms of expected height of dominant or codominant trees when the tree is 50 years old.

**SITE QUALITY** - A measurement of the productive capacity of a forest site, usually expressed in terms of expected annual volume growth of a given species.

**SIZE CLASS** - A grouping of broad ranges of tree sizes based on the common utility of trees within that size range (pole timber = 6" thru 12" diameters is used for pulpwood, small saw timber = 14" thru 16" diameters is used for lower value sawn products, large saw timber = 18" and larger diameters is for high grade lumber and veneer).

**SLOPE** - A measure of the steepness of ground. Slope is the change in elevation in feet over a 100 feet change in horizontal distance, expressed as a percentage.

**SOFTWOOD** - A term applied to trees with needle-like leaves, many of whose wood is softer than the wood of most broad-leafed trees. The term is roughly equivalent to gymnosperm, evergreen and coniferous and is the opposite of angiosperm and deciduous. In the Appalachians, softwoods are primarily represented by species of pine, spruce and hemlock.

**SPECIES DIVERSITY** - The variety of life forms associated with an area. Often used as an indicator of the health of an ecosystem.

**SPECIES RICHNESS** - A measure of the number of species present in a community, ecosystem, area or region.

**STEWARDSHIP** - The wise use and management and of forests to maintain or enhance forest resources (soil, water, air, plants, animals, recreation, aesthetics) for present and future generations. A long-term management perspective.

**STOCKING** - Refers to the density of trees in a forest, often in relative terms (high, medium, low) or quantitative terms (overstocked or understocked).

**STUMPAGE** - Standing trees.

**TREE** - A tall woody plant distinguished from a shrub by having comparatively greater height and usually a single stem rather than multiple stems.

**THREATENED SPECIES** - A species which is likely to become endangered in the foreseeable future throughout all or a significant portion of its range. This species may be rare with a relatively stable population or it may be common with a rapidly declining population.

**THINNING** - A cutting made to reduce stand density primarily to improve tree growth, enhance forest health or recover potential mortality.

**TWO-AGED FOREST STAND** - A forest stand of two distinct age classes that are separated in age by more than 20 % of rotation age.

**UNEVEN-AGED STAND** - A forest stand of three or more distinct age classes, either intimately mixed or in small groups, separated in age by more than 20 % of rotation age.

**UNDERSTOCKED** - A forest stand with a combination of basal area and stems per acre insufficient to optimally utilize available growing space.

**VEGETATIVE COVER** - The composite of all plant life on a given site.

**WATERSHED** - The entire area contributing to the supply of a river or lake; a drainage area. The entire area of land upon which the excess water (runoff) enters a common stream.

**WETLANDS** - Lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or where the land is covered with shallow and sometimes temporary water for at least part of the year.

**WOLF TREE** - A tree that occupies a relatively great deal of growing space, normally having a large, coarse crown and little or no merchantable stem. Its greatest value is for wildlife or aesthetic purposes.

## RECOMMENDATIONS:

1) **Establish control over public use of the property** - Identify allowable public uses, keeping in mind that the property is a municipal water supply, and not a city park. Develop rules and regulations governing public use of the property. Communicate these to the public and enforce them on a regular and consistent basis. Thought should be given to placing signs along Route 33, identifying that the City owns the property and stating allowable public uses. Many activities considered unacceptable, can be controlled by limiting public vehicular access into the property. Roads needed for management purposes need to be identified, gated, and locked, and remaining unneeded roads should be permanently closed and reclaimed. The City may want to consider adding a small parking area(s) along Route 33 in well a situated, controllable location.
   **High priority level, immediate action needed**

2) **Timber harvest to salvage hemlock trees** - Hemlock is a major component of the forest stands in management units 1-A, 2, and 6-A. The hemlock woolly adelgid is in the process of killing most or all of these trees, which will create an unsightly mess, and potentially increase the risk of wildfire, increase stream bank erosion, and increase stream sediment loads. Some of these trees should be salvaged before they become of no value.
   **High priority level, immediate action needed**

3) **Actively participate in efforts to improve the brook trout fishery on the property** - Work with the Virginia Department of Game and Inland Fisheries, and Trout Unlimited in managing and improving the brook trout fishery in Dry River and its tributaries. Maintaining a healthy brook trout population in this section of the river, translates to there being a continuous flow of high quality water available at the Water Department intake facility. **High priority level, continuous action needed**

4) **Inspect and maintain management roads on property on a regular basis** - Current maintenance needs observed on sections of the these roads include; grading, graveling, establishing vegetative cover, improvements to stream crossings, installing additional water control structures, installing culverts, and installing locked gates.
   **Moderate priority level, no immediate action needed, extended delay will increase cost to City, and potentially impact water quality**

5) **Implement a program for periodically maintaining the boundary lines around the property** - Boundary lines should be maintained (painted) about every five years. There are about 25 miles of boundary line around the property, some of these have been maintained by the U. S. Forest Service, and some are under water, so the goal should be to maintain between 3 to 4 miles per year. Some boundary lines may not be able to be located, and will require re-surveying by a licensed surveyor.
   **Moderate priority level, no immediate action needed, extended delay will increase cost to City**

6) **Implement an active, and continuous forest management program to develop forest stands on the property that have long term sustainability** - Use various silvicultural practices to create forest stands having more complex structures and more varied species mixes. This kind of forest stand is more capable of handling environmental adversities. Hopefully, this will reduce the need for heavy salvage type timber harvests, like the one that occurred last year on Skidmore Fork, in the future.
**Moderate priority level**, **no immediate action needed**

7) **Manage two forest stands in management unit 6-B for wildlife purposes** - Thin these stands, giving the crowns of the best mast producing trees more sunlight, and more room to grow, which will increase mast production, and provide more food for wildlife.
**Moderate priority level, no immediate action needed**

8) **Improve locations of pull off sites on Route 33** - Work with the Virginia Department of Highways to relocate or eliminate pull off sites that are too close to water courses. The level of daily activity at these sites may pose a risk to the City water supply.
**Low priority level, something to work towards**

9) **Research ownership** - of the old "Pendleton Turnpike" right of way, the 3 acre tract to the right of the Riven Rock Park entrance road, and the 8 acre Dr. Ralston tract. Determining this may be important for future management decisions.
**Low priority level, something to work on**

10) **Develop a hiking/ interpretive trail loop in management unit 4-B** - This is a steep, rough unit, with interesting geology, and a unique forest.
**Low priority level, something to think about**

## GENERAL FOREST MANAGEMENT RECOMMENDATIONS:

1) Protect all forests from wild fires, insects and diseases. Severely damaged and diseased trees should be removed from the stand during silvicultural treatments.

2) Leave at least three to five standing dead snags or live den trees per acre, for cavity nesting birds and animals. A few large wolf trees, especially good mast producers, should be left for the benefit of wildlife.

3) Protect unique habitats. Species and environmental conditions occur in these habitats that are difficult or impossible to reestablish if lost. Protection of these areas is an easy and effective way to help maintain species diversity.

4) Mature trees, undesirable trees, diseased trees and most damaged trees should be considered candidates for harvesting, leaving a good stocking of immature, desirable trees to make up the next forest stand.

5) Silvicultural treatments should be concentrated on the better sites first, where the largest increase in benefits for the forest and wildlife can be obtained.

6) Deer browsing can be extremely detrimental to a forest system and can potentially eliminate all the understory and regeneration. Research has shown that hardwood forests can not sustain a deer population above eighteen per square mile without doing damage to the forest and other wildlife species. Populations should be monitored and control measures, primarily hunting pressure, implemented to keep levels in balance with the capacity of the habitat.

7) Construct and maintain a good system of forest roads on the property to provide ready access for future forest management work and to serve as firebreaks. Properly located roads will help provide increased dispersed recreational opportunities and if seeded with the proper seed mixture and routinely maintained will greatly benefit many species of wildlife.

8) Water diversion measures and seeding should be used on all forest roads and landing sites constructed to reduce the possibility of erosion and siltation and to create wildlife feeding areas.

9) Over time various silvicultural treatments will be needed on many areas of the property. These may include cleanings in hardwood sapling stands to help certain desirable trees to out compete others , thinnings in pole and small saw timber stands to improve species composition and stocking and cuttings to release desirable regeneration from overtopping cull trees.

10) Climbing vines, especially grape vines, provide excellent wildlife food and sometimes cover. Vines in low value trees and where they have created an arbor in several tree tops should be left alone and worked around.

11) Maintain wildlife food species such as dogwood, serviceberry, sumac and viburnum, especially around the forest edge.

12) Establish and maintain buffer strips along all well-traveled roads and along streams for aesthetics and to protect streams from siltation or dramatic temperature changes. There may be situations where harvesting in the buffer areas is necessary for environmental or safety reasons, due to windstorms, insect infestation, disease outbreak or over maturity.

13) Consult with a forester whenever questions arise regarding the management of the forests on the property. Timber should never be sold without having a written agreement with the buyer. The landowner typically receives a better price for his timber and gets a better harvesting job done when a forester is involved in the sale.

## FOREST MANAGEMENT ACTIVITY SCHEDULE (10 YEAR):

**2009 -** 1) Close off & reclaim unnecessary roads, install gates on all open roads
1) Inspect & maintain roads
2) Maintain 3 to 4 miles of boundary line
3) Monitor gypsy moth population on Management Units 4-B, 5-B, 6-B & 7-B
4) Salvage hemlock timber on Management Unit 6-A
5) Timber harvest on Management Unit 1-A (1/2 the acreage)

**2010 -** 1) Inspect & maintain roads
2) Maintain 3 to 4 miles of boundary line
3) Monitor gypsy moth population on Management Units 4-B, 5-B, 6-B & 7-B
4) Timber harvest in wildlife mast production areas on Management Unit 6-B
5) Timber harvest on Management Unit 2 (1/2 the acreage)

**2011 -** 1) Inspect & maintain roads
2) Maintain 3 to 4 miles of boundary line
3) Monitor gypsy moth population on Management Units 4-B, 5-B, 6-B & 7-B
4) Timber harvest on Management Unit 1-A (1/2 the acreage)

**2012 -** 1) Inspect & maintain roads
2) Maintain 3 to 4 miles of boundary line
3) Monitor gypsy moth population on Management Units 4-B, 5-B, 6-B & 7-B
4) Timber harvest on Management Unit 2 (1/2 the acreage)

**2013 -** 1) Inspect & maintain roads
2) Maintain 3 to 4 miles of boundary line
3) Monitor gypsy moth population on Management Units 4-B, 5-B, 6-B & 7-B
4) Timber harvest on Management Unit 3 (1/2 the acreage)

**2014 -** 1) Inspect & maintain roads
2) Maintain 3 to 4 miles of boundary line
3) Monitor gypsy moth population on Management Units 4-B, 5-B, 6-B & 7-B
4) Timber harvest on Management Unit 4-A (1/2 the acreage)

**2015 -** 1) Inspect & maintain roads
2) Maintain 3 to 4 miles of boundary line
3) Monitor gypsy moth population on Management Units 4-B, 5-B, 6-B & 7-B
4) Timber harvest on Management Unit 3 (1/2 the acreage)

**2016 -** 1) Inspect & maintain roads
2) Maintain 3 to 4 miles of boundary line
3) Monitor gypsy moth population on Management Units 4-B, 5-B, 6-B & 7-B
4) Timber harvest on Management Unit 4-A (1/2 the acreage)

**2017 -** 1) Inspect & maintain roads
2) Maintain 3 to 4 miles of boundary line
3) Monitor gypsy moth population on Management Units 4-B, 5-B, 6-B & 7-B
4) Timber harvest on Management Unit 7-A

**2018 -** 1) Inspect & maintain roads
2) Maintain 3 to 4 miles of boundary line
3) Monitor gypsy moth population on Management Units 4-B, 5-B, 6-B & 7-B
4) Timber harvest on Management Unit 5-A (areas not harvested in 2007)

## MANAGEMENT UNIT 1-A SUMMARY:

**LOCATION:** west side of Route 33, from the lower end of City property at Riven Rock Park to the U. S. Forest Service boundary at the Virginia Game Commission shed; most of unit lies on the west side of Dry River

**ACREAGE:** 156 +/- acres of which 142 +/- acres is forest land; includes Riven Rock Park & the water intake system

**ACCESS:** fair to excellent; the Riven Rock Park entrance road provides access to Route 33; only usable access to the area west of Dry River is a ford in Riven Rock Park

**TOPOGRAPHY:** relatively flat terrain, lies mainly in the bottom land area between Dry River and the base of Riven Rock Mountain; over the length of the unit, a distance of approximately 1.1 miles, elevation changes about 80 feet, averaging less than a 2 % slope; several small streams flow through area into Dry River; several dry channels & rock berms noted on the north end of unit

**SOILS:** typic udorthents, map unit symbol 70A, good for growing trees

**FOREST:** a relatively old, heavily stocked, mature forest stand, averaging 323 trees & 141 square feet of basal area per acre, with saw timber averaging over 17 thousand board feet per acre & pulpwood averaging over 8 cords per acre; total saw timber volume - 2.436 million board feet, primarily yellow poplar (1.143 million board feet), white pine (588 thousand board feet) and hemlock (173 thousand board feet), total pulpwood volume - 1,226 cords; 47 merchantable saw timber trees per acre; 1/3 of the merchantable trees on the unit are hemlock; tree reproduction is lacking & at best very spotty

**COMMENTS:** other than Riven Rock Park, the unit is not readily accessible & does not appear to get the amount of public use as some of the other units

**RECOMENDATIONS:** 1) the hemlock woolly adelgid will have a significant impact on this forest stand & some of these trees should be salvaged before they are of no value; 2) a forest stand having long term sustainability should be developed by implementing various silvicultural treatments that will vary species composition & stand structure, through a series of combined improvement, single tree & group selection cuttings

# MANAGEMENT UNIT 1 - A

RIVEN ROCK PARK NORTH TO U.S.F.S. LINE AT VIRGINIA GAME COMMISION SHED

**156 +/- ACRES**

**(142 +/- ACRES OF WOODLAND)**

# TIMBER CRUISE REPORT

**TABLE # 1 - ESTIMATED SAW TIMBER VOLUMES BY SPECIES & DIAMETER CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)**

| DBH | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY | SFT. MAPLE |
|---|---|---|---|---|---|---|---|
| 14 | 25,659 | 20,732 | 43,835 | 4,601 | 2,300 | 12,368 | 11,587 |
| 16 | 37,048 | 26,511 | 33,100 | 7,285 | 12,879 | 4,075 | 16,983 |
| 18 | 97,952 | 45,213 | 38,567 | 17,381 | 15,393 | 12,340 | 11,616 |
| 20 | 199,993 | 34,392 | 29,280 | 26,881 | 9,315 | 0 | 4,288 |
| 22 | 149,725 | 81,508 | 8,648 | 22,280 | 45,000 | 16,316 | 0 |
| 24 | 214,008 | 115,744 | 12,752 | 6,092 | 13,944 | 0 | 0 |
| 26 | 202,307 | 104,853 | 0 | 24,864 | 15,237 | 0 | 0 |
| 28 | 144,712 | 84,192 | 0 | 24,296 | 0 | 0 | 0 |
| 30 + | 71,412 | 75,118 | 6,376 | 6,376 | 0 | 0 | 0 |
| **TOTAL** | **1,142,816** | **588,263** | **172,558** | **140,056** | **114,068** | **45,099** | **44,474** |

| DBH | HD. MAPLE | CUCUMBER | BEECH | SYCAMORE | BASSWOOD | WH. ASH | BL. BIRCH |
|---|---|---|---|---|---|---|---|
| 14 | 5,396 | 0 | 0 | 7,767 | 5,396 | 0 | 3,096 |
| 16 | 0 | 0 | 0 | 7,441 | 8,137 | 0 | 6,475 |
| 18 | 11,616 | 8,051 | 12,496 | 5,808 | 0 | 0 | 6,560 |
| 20 | 9,315 | 0 | 13,504 | 4,388 | 4,288 | 0 | 0 |
| 22 | 5,169 | 11,928 | 3,465 | 0 | 6,589 | 10,352 | 0 |
| 24 | 0 | 0 | 0 | 0 | 0 | 4,416 | 0 |
| 26 | 0 | 5,368 | 0 | 0 | 0 | 0 | 0 |
| 28 | 0 | 6,915 | 0 | 0 | 0 | 3,564 | 0 |
| 30 + | 4,672 | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | **36,168** | **32,262** | **29,465** | **25,404** | **24,410** | **18,332** | **16,131** |

| DBH | CH. OAK | TOTAL |
|---|---|---|
| 14 | 0 | 142,737 |
| 16 | 3,223 | 163,157 |
| 18 | 0 | 282,993 |
| 20 | 3,380 | 339,024 |
| 22 | 0 | 360,980 |
| 24 | 0 | 366,956 |
| 26 | 0 | 352,629 |
| 28 | 0 | 263,679 |
| 30 + | 0 | 163,954 |
| **TOTAL** | **6,603** | **2,436,109** |

## TABLE # 2 - ESTIMATED SAW TIMBER VOLUMES PER ACRE BY SPECIES & SIZE CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 441.6 | 332.7 | 541.8 | 83.7 | 106.9 | 115.8 |
| LARGE (18" DBH & UP) | 7,606.4 | 3,810.0 | 673.4 | 902.6 | 696.4 | 201.2 |
| **TOTAL** | **8,048.0** | **4,142.7** | **1,215.2** | **986.3** | **803.3** | **317.6** |

| SPECIES | SFT. MAPLE | HD. MAPLE | CUCUMBER | BEECH | SYCAMORE | BASSWOOD |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 201.2 | 38.0 | - 0 - | - 0 - | 107.1 | 95.3 |
| LARGE (18" DBH & UP) | 112.0 | 216.7 | 227.2 | 207.5 | 71.8 | 76.6 |
| **TOTAL** | **313.2** | **254.7** | **227.2** | **207.5** | **178.9** | **171.9** |

| SPECIES | WH. ASH | BL. BIRCH | CH. OAK | TOTAL |
|---|---|---|---|---|
| SMALL (14 - 16" DBH) | - 0 - | 67.4 | 22.7 | **2,154.2** |
| LARGE (18" DBH & UP) | 129.1 | 46.2 | 23.8 | **15,001.5** |
| **TOTAL** | **129.1** | **113.6** | **46.5** | **17,155.7** |

## TABLE # 3 - ESTIMATED PULPWOOD VOLUMES BY SPECIES: (IN WEIGHT CORDS)

| SPECIES | VOLUME/ACRE | TOTAL VOLUME |
|---|---|---|
| YEL. POPLAR | 0.82 | 116 |
| WH. PINE | 0.53 | 75 |
| HEMLOCK | 3.33 | 473 |
| RD. OAK | 0.25 | 36 |
| WH. OAK | 0.18 | 26 |
| HICKORY | 0.24 | 34 |
| SFT. MAPLE | 0.73 | 104 |
| HD. MAPLE | 0.39 | 55 |
| CUCUMBER | 0.17 | 24 |
| BEECH | 0.12 | 17 |
| SYCAMORE | 0.18 | 26 |
| BASSWOOD | 0.12 | 17 |
| WH. ASH | 0.14 | 20 |
| BL. BIRCH | 1.06 | 151 |
| MISC. HWDS. | 0.24 | 34 |
| YEL. PINE | 0.13 | 18 |
| TOTAL | 8.63 | 1,226 |

## TABLE # 4 - ESTIMATED NUMBER OF TREES PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| **SAPLING** | 28.02 | 15.28 | 86.62 | - 0 - | - 0 - | - 0 - |
| **POLE TIMBER** | 7.78 | 2.96 | 41.59 | 3.81 | 0.98 | 3.59 |
| **SMALL SAW TIMBER** | 3.14 | 2.68 | 5.54 | 0.74 | 0.69 | 0.99 |
| **LARGE SAW TIMBER** | 12.84 | 5.33 | 2.10 | 2.13 | 1.73 | 0.63 |
| **TOTAL** | **51.78** | **26.25** | **135.85** | **6.68** | **3.40** | **5.21** |

| SPECIES | SFT. MAPLE | HD. MAPLE | CUCUMBER | BEECH | SYCAMORE | BASSWOOD |
|---|---|---|---|---|---|---|
| **SAPLING** | 10.19 | - 0 - | - 0 - | 10.19 | - 0 - | - 0 - |
| **POLE TIMBER** | 7.19 | 4.14 | 1.68 | 2.54 | 1.95 | 2.90 |
| **SMALL SAW TIMBER** | 2.36 | 0.42 | - 0 - | - 0 - | 0.42 | 0.74 |
| **LARGE SAW TIMBER** | 0.48 | 0.70 | 0.53 | 0.87 | 0.43 | 0.18 |
| **TOTAL** | **20.22** | **5.26** | **2.21** | **13.60** | **2.80** | **3.82** |

| SPECIES | WH. ASH | BL. BIRCH | CH. OAK | MISC. HWDS. | YEL. PINE | TOTAL |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | 7.64 | - 0 - | 15.29 | - 0 - | **173.23** |
| **POLE TIMBER** | 0.41 | 14.58 | - 0 - | 3.95 | 1.77 | **101.82** |
| **SMALL SAW TIMBER** | - 0 - | 0.74 | 0.16 | - 0 - | - 0 - | **18.62** |
| **LARGE SAW TIMBER** | 0.42 | 0.38 | 0.10 | - 0 - | - 0 - | **28.85** |
| **TOTAL** | **0.83** | **23.34** | **0.26** | **19.24** | **1.77** | **322.52** |

## TABLE # 5 - ESTIMATED BASAL AREA PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| **SAPLING** | 1.11 | 0.66 | 4.22 | - 0 - | - 0 - | - 0 - |
| **POLE TIMBER** | 2.89 | 1.55 | 14.23 | 1.10 | 0.66 | 1.10 |
| **SMALL SAW TIMBER** | 3.78 | 3.33 | 6.44 | 0.88 | 0.87 | 1.11 |
| **LARGE SAW TIMBER** | 35.99 | 16.21 | 4.43 | 5.77 | 4.45 | 1.34 |
| **TOTAL** | **43.77** | **21.75** | **29.32** | **7.75** | **5.98** | **3.55** |

| SPECIES | SFT. MAPLE | HD. MAPLE | CUCUMBER | BEECH | SYCAMORE | BASSWOOD |
|---|---|---|---|---|---|---|
| **SAPLING** | 0.22 | - 0 - | - 0 - | 0.22 | - 0 - | - 0 - |
| **POLE TIMBER** | 2.21 | 1.55 | 0.66 | 0.66 | 0.66 | 0.66 |
| **SMALL SAW TIMBER** | 2.89 | 0.44 | - 0 - | - 0 - | 0.44 | 0.88 |
| **LARGE SAW TIMBER** | 0.89 | 1.55 | 1.32 | 1.78 | 0.88 | 0.44 |
| **TOTAL** | **6.21** | **3.54** | **1.98** | **2.66** | **1.98** | **1.98** |

| SPECIES | WH. ASH | BL. BIRCH | CH. OAK | MISC. HWDS. | YEL. PINE | TOTAL |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | 0.67 | - 0 - | 0.66 | - 0 - | **7.76** |
| **POLE TIMBER** | 0.22 | 4.45 | - 0 - | 1.10 | 0.44 | **34.14** |
| **SMALL SAW TIMBER** | - 0 - | 0.88 | 0.22 | - 0 - | - 0 - | **22.16** |
| **LARGE SAW TIMBER** | 1.10 | 0.67 | 0.22 | - 0 - | - 0 - | **77.04** |
| **TOTAL** | **1.32** | **6.67** | **0.44** | **1.76** | **0.44** | **141.10** |

* MISC. HWDS. INCLUDES BL. GUM, SASSAFRAS & BL. LOCUST.

* YEL. PINE INCLUDES VA. PINE & PITCH PINE.

* VOLUME ESTIMATES ARE BASED ON A SYSTEMATIC PRISM CRUISE (10 BAF) OF 45 SAMPLE PLOTS.

## MANAGEMENT UNIT 1-B SUMMARY:

**LOCATION:** east of Route 33, at the end of the U. S. Forest Service's Rocky Run Road

**ACREAGE:** 10 +/- acres of which 9 +/- acres is forest land

**ACCESS:** excellent, Rocky Run Road provides access to Route 33

**TOPOGRAPHY:** relatively flat terrain, lies mainly in the bottom land area along Rocky Run; over the length of the unit, a distance of approximately 0.3 miles, elevation changes about 20 feet, averaging less than a 2 % slope

**SOILS:** typic udorthents, map unit symbol 70A, good for growing trees

**FOREST:** a relatively old, heavily stocked, mature forest stand, averaging 456 trees & 132 square feet of basal area per acre, with saw timber averaging over 9 thousand board feet per acre & pulpwood averaging over 12 cords per acre; total saw timber volume - 81 thousand board feet, primarily white pine (30 thousand board feet), yellow poplar (23 thousand board feet) and red oak (21 thousand board feet), total pulpwood volume - 113 cords; 31 merchantable saw timber trees per acre; tree reproduction is lacking

**COMMENTS:** unit is isolated from main City tract on Dry River & is surrounded by U. S. Forest Service property; lies down stream from where the City takes water from Dry River; a lot of rock & woody material has been moved around along Rocky Run by high water; activity from the U. S. Forest Service ATV trail further up Rocky Run has been carried over onto this unit

**RECOMENDATIONS:** Rocky Run is a big factor in managing this forest; probably not economically justifiable to take on the problems associated with working so close to this stream; no forest management activity is recommended for this unit; City may want to consider trading this area to the U. S. Forest Service for other land adjoining City property on Dry River

# MANAGEMENT UNIT 1 - B

ROCKY RUN

**10 +/- ACRES**

**(9 +/- ACRES OF WOODLAND)**

# TIMBER CRUISE REPORT

**TABLE # 1 - ESTIMATED SAW TIMBER VOLUMES BY SPECIES & DIAMETER CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)**

| DBH | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | SYCAMORE | TOTA |
|---|---|---|---|---|---|---|---|
| 14 | 0 | 1,095 | 0 | 1,095 | 1,470 | 0 | 3,660 |
| 16 | 8.055 | 3,465 | 0 | 5,715 | 0 | 1,140 | 18,375 |
| 18 | 4,995 | 1,980 | 2,325 | 7,845 | 0 | 0 | 17,145 |
| 20 | 2,760 | 8,820 | 0 | 2,760 | 0 | 0 | 14,340 |
| 22 | 2,085 | 3,135 | 2,460 | 3,735 | 0 | 0 | 11,415 |
| 24 | 2,100 | 5,655 | 0 | 0 | 0 | 0 | 7,755 |
| 26 | 2,550 | 6,210 | 0 | 0 | 0 | 0 | 8,760 |
| 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 + | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | **22,545** | **30,360** | **4,785** | **21,150** | **1,470** | **1,140** | **81,450** |

**TABLE # 2 - ESTIMATED SAW TIMBER VOLUMES PER ACRE BY SPECIES & SIZE CLASS:**

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | SYCAMORE |
|---|---|---|---|---|---|---|
| **SMALL (14 - 16" DBH)** | 895.0 | 506.7 | - 0 - | 756.7 | 163.3 | 126.7 |
| **LARGE (18" DBH & UP)** | 1,610.0 | 2,866.6 | 531.6 | 1,593.4 | - 0 - | - 0 - |
| **TOTAL** | **2,505.0** | **3,373.3** | **531.6** | **2,350.1** | **163.3** | **126.7** |

| SPECIES | TOTAL |
|---|---|
| **SMALL (14 - 16" DBH)** | **2,448.4** |
| **LARGE (18" DBH & UP)** | **6,601.6** |
| **TOTAL** | **9,050.0** |

## TABLE # 3 - ESTIMATED PULPWOOD VOLUMES BY SPECIES: (IN WEIGHT CORDS)

| SPECIES | VOLUME/ACRE | TOTAL VOLUME |
|---|---|---|
| YEL. POPLAR | 1.20 | 11 |
| WH. PINE | 0.48 | 4 |
| HEMLOCK | 3.86 | 35 |
| RD. OAK | 0.44 | 4 |
| WH. OAK | 0.44 | 4 |
| SFT. MAPLE | 2.12 | 19 |
| SYCAMORE | 0.44 | 4 |
| BL. BIRCH | 2.41 | 22 |
| MISC. HWDS. | 1.10 | 10 |
| TOTAL | 12.49 | 113 |

## TABLE # 4 - ESTIMATED NUMBER OF TREES PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | SFT. MAPLE |
|---|---|---|---|---|---|---|
| SAPLING | - 0 - | - 0 - | 171.97 | - 0 - | - 0 - | - 0 - |
| POLE TIMBER | 7.84 | 3.06 | 53.06 | 2.12 | 2.12 | 30.93 |
| SMALL SAW TIMBER | 6.33 | 3.95 | - 0 - | 5.14 | 1.56 | - 0 - |
| LARGE SAW TIMBER | 4.26 | 5.83 | 1.57 | 5.79 | - 0 - | - 0 - |
| TOTAL | 18.43 | 12.84 | 226.60 | 13.05 | 3.68 | 30.93 |

| SPECIES | HD. MAPLE | SYCAMORE | BL. BIRCH | MISC. HWDS. | TOTAL |
|---|---|---|---|---|---|
| SAPLING | 19.10 | - 0 - | 38.21 | 38.21 | 267.49 |
| POLE TIMBER | - 0 - | 4.78 | 36.48 | 12.61 | 153.00 |
| SMALL SAW TIMBER | - 0 - | 1.19 | - 0 - | - 0 - | 18.17 |
| LARGE SAW TIMBER | - 0 - | - 0 - | - 0 - | - 0 - | 17.45 |
| TOTAL | 19.10 | 5.97 | 74.69 | 50.82 | 456.11 |

## TABLE # 5 - ESTIMATED BASAL AREA PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | SFT. MAPLE |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | - 0 - | 5.00 | - 0 - | - 0 - | - 0 - |
| **POLE TIMBER** | 3.34 | 1.67 | 18.34 | 1.67 | 1.67 | 10.00 |
| **SMALL SAW TIMBER** | 8.34 | 5.00 | - 0 - | 6.67 | 1.67 | - 0 - |
| **LARGE SAW TIMBER** | 10.01 | 15.00 | 3.34 | 11.67 | - 0 - | - 0 - |
| **TOTAL** | **21.69** | **21.67** | **26.68** | **20.01** | **3.34** | **10.00** |

| SPECIES | HD. MAPLE | SYCAMORE | BL. BIRCH | MISC. HWDS. | TOTAL |
|---|---|---|---|---|---|
| **SAPLING** | 1.67 | - 0 - | 3.33 | 3.33 | **13.33** |
| **POLE TIMBER** | - 0 - | 1.67 | 11.67 | 5.00 | **55.03** |
| **SMALL SAW TIMBER** | - 0 - | 1.67 | - 0 - | - 0 - | **23.35** |
| **LARGE SAW TIMBER** | - 0 - | - 0 - | - 0 - | - 0 - | **40.02** |
| **TOTAL** | **1.67** | **3.34** | **15.00** | **8.33** | **131.73** |

* MISC. HWDS. INCLUDES SASSAFRAS & BL. GUM.

* VOLUME ESTIMATES ARE BASED ON A SYSTEMATIC PRISM CRUISE (10 BAF) OF 6 SAMPLE PLOTS.

## MANAGEMENT UNIT 2 SUMMARY:

**LOCATION:** west side of Route 33, from the U. S. Forest Service boundary at the Virginia Game Commission shed north to Kephart Run

**ACREAGE:** 140 +/- acres of which 127 +/- acres is forest land

**ACCESS:** excellent, several woods road entrances to Route 33

**TOPOGRAPHY:** relatively flat terrain, lies mainly in the bottom land area between Route 33 and Dry River; over the length of the unit, a distance of approximately 1.4 miles, elevation changes about 60 feet, averaging less than a 1 % slope

**SOILS:** typic udorthents, map unit symbol 70A, good for growing trees

**FOREST:** a relatively old, heavily stocked, mature forest stand, averaging 324 trees & 142 square feet of basal area per acre, with saw timber averaging over 15 thousand board feet per acre & pulpwood averaging over 9 cords per acre; total saw timber volume - 1.966 million board feet, primarily yellow poplar (691 thousand board feet), white pine (665 thousand board feet) and hemlock (149 thousand board feet), total pulpwood volume - 1,243 cords; 44 merchantable saw timber trees per acre; over 1/4 of the merchantable trees on the unit are hemlock; tree reproduction is lacking

**COMMENTS:** unit gets heavy public use; has a complex web of "off road vehicle" trails, is the hub for much of this activity on the property; many camping sites

**RECOMENDATIONS:** 1) put a halt to the "off road vehicle" activity, block river crossings & most access points to Route 33 with dirt berms (tank traps), install locked gates at a couple of access points to Route 33; 2) eliminate & reclaim all unnecessary roads & trails; 3) restrict camping in areas near water courses; 4) the hemlock woolly adelgid will have a significant impact on this forest stand & some of these trees should be salvaged before they are of no value; 5) a forest stand having long term sustainability should be developed by implementing various silvicultural treatments that will vary species composition & stand structure, through a series of combined improvement, single tree & group selection cuttings

# MANAGEMENT UNIT 2

U.S.F.S. LINE AT VIRGINIA GAME COMMISION SHED NORTH TO KEPHART RUN

**140 +/- ACRES**

**(127 +/- ACRES OF WOODLAND)**

# TIMBER CRUISE REPORT

**TABLE # 1 - ESTIMATEDSAW TIMBER VOLUMES BY SPECIES & DIAMETER CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)**

| DBH | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY | SFT. MAPLE |
|---|---|---|---|---|---|---|---|
| 14 | 28,232 | 2,540 | 14,262 | 2,375 | 3,188 | 15,824 | 0 |
| 16 | 33,210 | 31,001 | 29,248 | 4,204 | 10,846 | 12,598 | 3,327 |
| 18 | 68,974 | 55,093 | 35,624 | 4,293 | 3,391 | 25,235 | 11,824 |
| 20 | 37,643 | 75,057 | 33,350 | 18,466 | 4,432 | 6,972 | 3,480 |
| 22 | 88,671 | 112,700 | 19,736 | 13,576 | 8,103 | 0 | 0 |
| 24 | 159,499 | 103,581 | 11,430 | 28,816 | 3,581 | 0 | 0 |
| 26 | 88,710 | 27,457 | 0 | 7,290 | 9,182 | 0 | 0 |
| 28 | 51,194 | 93,040 | 5,563 | 14,846 | 0 | 0 | 0 |
| 30 + | 134,810 | 164,998 | 0 | 5,664 | 0 | 0 | 0 |
| **TOTAL** | **690,943** | **665,467** | **149,213** | **99,530** | **42,723** | **60,629** | **18,631** |

| DBH | HD. MAPLE | CUCUMBER | BEECH | SYCAMORE | BASSWOOD | WH. ASH | BL. BIRCH |
|---|---|---|---|---|---|---|---|
| 14 | 10,325 | 0 | 0 | 0 | 0 | 5,563 | 2,375 |
| 16 | 5,791 | 4,204 | 4,204 | 15,050 | 2,476 | 9,080 | 4,953 |
| 18 | 13,576 | 0 | 5,893 | 21,323 | 0 | 8,433 | 0 |
| 20 | 16,777 | 0 | 2,540 | 10,427 | 5,182 | 11,760 | 0 |
| 22 | 10,719 | 6,160 | 0 | 0 | 4,521 | 0 | 0 |
| 24 | 0 | 4,559 | 0 | 0 | 0 | 0 | 0 |
| 26 | 0 | 0 | 0 | 0 | 10,947 | 0 | 0 |
| 28 | 11,036 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 + | 0 | 0 | 0 | 0 | 0 | 4,750 | 0 |
| **TOTAL** | **68,224** | **14,923** | **12,637** | **46,800** | **23,126** | **39,586** | **7,328** |

| DBH | CH. OAK | YEL. PINE | TOTAL |
|---|---|---|---|
| 14 | 0 | 0 | **84,684** |
| 16 | 4,204 | 3,327 | **177,723** |
| 18 | 11,824 | 3,391 | **268,874** |
| 20 | 3,480 | 0 | **229,566** |
| 22 | 0 | 0 | **264,186** |
| 24 | 0 | 0 | **311,466** |
| 26 | 0 | 0 | **143,586** |
| 28 | 0 | 0 | **175,679** |
| 30 + | 0 | 0 | **310,222** |
| **TOTAL** | **19,508** | **6,718** | **1,965,986** |

## TABLE # 2 - ESTIMATED SAW TIMBER VOLUMES PER ACRE BY SPECIES & SIZE CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 483.8 | 264.1 | 342.6 | 51.8 | 110.5 | 223.8 |
| LARGE (18" DBH & UP) | 4,956.7 | 4,975.8 | 832.3 | 731.9 | 225.9 | 253.6 |
| **TOTAL** | **5,440.5** | **5,239.9** | **1,174.9** | **783.7** | **336.4** | **477.4** |

| SPECIES | SFT. MAPLE | HD. MAPLE | CUCUMBER | BEECH | SYCAMORE | BASSWOOD |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 26.2 | 126.9 | 33.1 | 33.1 | 118.5 | 19.5 |
| LARGE (18" DBH & UP) | 120.5 | 410.3 | 84.4 | 66.4 | 250.0 | 162.6 |
| **TOTAL** | **146.7** | **537.2** | **117.5** | **99.5** | **368.5** | **182.1** |

| SPECIES | WH. ASH | BL. BIRCH | CH. OAK | YEL. PINE | TOTAL |
|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 115.3 | 57.7 | 33.1 | 26.2 | **2,066.2** |
| LARGE (18" DBH & UP) | 196.4 | - 0 - | 120.5 | 26.7 | **13,414.0** |
| **TOTAL** | **311.7** | **57.7** | **153.6** | **52.9** | **15,480.2** |

## TABLE # 3 - ESTIMATED PULPWOOD VOLUMES BY SPECIES: (IN WEIGHT CORDS)

| SPECIES | VOLUME/ACRE | TOTAL VOLUME |
|---|---|---|
| YEL. POPLAR | 1.25 | 159 |
| WH. PINE | 1.17 | 149 |
| HEMLOCK | 2.37 | 301 |
| RD. OAK | 0.31 | 39 |
| WH. OAK | 0.05 | 6 |
| HICKORY | 0.44 | 56 |
| SFT. MAPLE | 0.75 | 95 |
| HD. MAPLE | 0.54 | 69 |
| BEECH | 0.04 | 5 |
| SYCAMORE | 0.67 | 85 |
| BASSWOOD | 0.14 | 18 |
| WH. ASH | 0.26 | 33 |
| BL. BIRCH | 0.79 | 100 |
| CH. OAK | 0.19 | 24 |
| MISC. HWDS. | 0.52 | 66 |
| YEL. PINE | 0.30 | 38 |
| TOTAL | 9.79 | 1,243 |

## TABLE # 4 - ESTIMATED NUMBER OF TREES PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | 2.94 | 70.55 | - 0 - | 2.94 | 2.94 |
| **POLE TIMBER** | 9.90 | 9.98 | 35.53 | 3.45 | 0.73 | 4.10 |
| **SMALL SAW TIMBER** | 3.63 | 1.53 | 3.39 | 0.42 | 0.79 | 1.75 |
| **LARGE SAW TIMBER** | 8.48 | 7.36 | 2.86 | 1.77 | 0.68 | 0.97 |
| **TOTAL** | **22.01** | **21.81** | **112.33** | **5.64** | **5.14** | **9.76** |

| SPECIES | SFT. MAPLE | HD. MAPLE | CUCUMBER | BEECH | SYCAMORE | BASSWOOD |
|---|---|---|---|---|---|---|
| **SAPLING** | 26.46 | 5.88 | - 0 - | 11.76 | - 0 - | - 0 - |
| **POLE TIMBER** | 5.68 | 7.45 | - 0 - | 0.73 | 4.10 | 0.33 |
| **SMALL SAW TIMBER** | 0.18 | 1.33 | 0.18 | 0.18 | 0.73 | 0.37 |
| **LARGE SAW TIMBER** | 0.56 | 1.52 | 0.18 | 0.56 | 0.97 | 0.43 |
| **TOTAL** | **32.88** | **16.18** | **0.36** | **13.23** | **5.80** | **1.13** |

| SPECIES | WH. ASH | BL. BIRCH | CH. OAK | MISC. HWDS. | YEL. PINE | TOTAL |
|---|---|---|---|---|---|---|
| **SAPLING** | 2.94 | 23.52 | - 0 - | 23.52 | - 0 - | **173.45** |
| **POLE TIMBER** | 2.29 | 12.63 | 1.96 | 5.79 | 2.27 | **106.92** |
| **SMALL SAW TIMBER** | 0.85 | 0.61 | 0.18 | - 0 - | 0.18 | **16.30** |
| **LARGE SAW TIMBER** | 0.58 | - 0 - | 0.56 | 0.12 | 0.15 | **27.75** |
| **TOTAL** | **6.66** | **36.76** | **2.70** | **29.43** | **2.60** | **324.42** |

## TABLE # 5 - ESTIMATED BASAL AREA PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | 0.26 | 2.31 | - 0 - | 0.26 | 0.26 |
| **POLE TIMBER** | 4.36 | 4.35 | 11.02 | 1.29 | 0.26 | 1.80 |
| **SMALL SAW TIMBER** | 4.36 | 2.05 | 4.10 | 0.52 | 1.03 | 2.05 |
| **LARGE SAW TIMBER** | 25.63 | 22.33 | 6.16 | 5.14 | 1.80 | 1.79 |
| **TOTAL** | **34.35** | **28.99** | **23.59** | **6.95** | **3.35** | **5.90** |

| SPECIES | SFT. MAPLE | HD. MAPLE | CUCUMBER | BEECH | SYCAMORE | BASSWOOD |
|---|---|---|---|---|---|---|
| **SAPLING** | 0.77 | 0.51 | - 0 - | 0.26 | - 0 - | - 0 - |
| **POLE TIMBER** | 2.82 | 2.56 | - 0 - | 0.26 | 2.57 | 0.26 |
| **SMALL SAW TIMBER** | 0.26 | 1.54 | 0.26 | 0.26 | 1.03 | 0.51 |
| **LARGE SAW TIMBER** | 1.03 | 3.60 | 0.52 | 1.03 | 1.79 | 1.29 |
| **TOTAL** | **4.88** | **8.21** | **0.78** | **1.81** | **5.39** | **2.06** |

| SPECIES | WH. ASH | BL. BIRCH | CH. OAK | MISC. HWDS. | YEL. PINE | TOTAL |
|---|---|---|---|---|---|---|
| **SAPLING** | 0.26 | 1.29 | - 0 - | 0.51 | - 0 - | **6.69** |
| **POLE TIMBER** | 1.03 | 3.59 | 0.77 | 1.82 | 1.03 | **39.79** |
| **SMALL SAW TIMBER** | 1.02 | 0.77 | 0.26 | - 0 - | 0.26 | **20.28** |
| **LARGE SAW TIMBER** | 1.28 | - 0 - | 1.03 | 0.26 | 0.26 | **74.94** |
| **TOTAL** | **3.59** | **5.65** | **2.06** | **2.59** | **1.55** | **141.70** |

* MISC. HWDS. INCLUDES BL. GUM, BL. CHERRY & BL. LOCUST.

* YEL. PINE INCLUDES VA. PINE & PITCH PINE.

* VOLUME ESTIMATES ARE BASED ON A SYSTEMATIC PRISM CRUISE (10 BAF) OF 39 SAMPLE PLOTS.

## MANAGEMENT UNIT 3 SUMMARY:

**LOCATION:** southwest side of Route 33, from Kephart Run northwest to the Dry Run Road

**ACREAGE:** 256 +/- acres of which 233 +/- acres is forest land

**ACCESS:** fair to excellent, access to some areas of will require crossing Dry River, access to other areas can be directly from Route 33; the Dry Run Road is the main access into the unit

**TOPOGRAPHY:** relatively flat terrain, lies mainly in the bottom land area between Route 33 and the base of Goods Mountain , over the length of the unit, a distance of approximately 1.8 miles, elevation changes about 160 feet, averaging less than a 2 % slope

**SOILS:** typic udorthents, map unit symbol 70A

**FOREST:** a relatively old, heavily stocked, mature forest stand, averaging 323 trees & 136 square feet of basal area per acre, with saw timber averaging almost 12 thousand board feet per acre & pulpwood averaging 12 cords per acre; total saw timber volume - 2.735 million board feet, primarily white pine (1.612 million board feet), yellow poplar (478 thousand board feet), and sycamore (205 thousand board feet), total pulpwood volume - 2,795 cords; 39 merchantable saw timber trees per acre; tree reproduction better than most units, but still lacking

**COMMENTS:** unit has several heavily used "off road vehicle" trails & camping sites

**RECOMENDATIONS:** 1) put a halt to the "off road vehicle" activity, block river crossings & most access points to Route 33 with dirt berms (tank traps), install a locked gate on the Dry Run Road & any other needed access points; 2) eliminate & reclaim all unnecessary roads & trails; 3) restrict camping in areas near water courses; 4) construct parking site near the Dry Run Road entrance; 5) a forest stand having long term sustainability should be developed by implementing various silvicultural treatments that will vary species composition & stand structure, through a series of combined improvement, single tree & group selection cuttings

# MANAGEMENT UNIT 3

KEPHART RUN NORTHWEST TO DRY RUN ROAD

**256 +/- ACRES**

**(233 +/- ACRES OF WOODLAND)**

# TIMBER CRUISE REPORT

**TABLE # 1 - ESTIMATEDSAW TIMBER VOLUMES BY SPECIES & DIAMETER CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)**

| DBH | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY | SFT. MAPLE |
|---|---|---|---|---|---|---|---|
| 14 | 16,263 | 71,531 | 20,504 | 0 | 0 | 3,565 | 2,656 |
| 16 | 65,869 | 115,964 | 44,666 | 2,773 | 2,773 | 14,889 | 3,705 |
| 18 | 62,001 | 193,856 | 44,317 | 3,775 | 3,775 | 3,775 | 6,710 |
| 20 | 54,825 | 205,366 | 4,940 | 9,576 | 3,891 | 0 | 0 |
| 22 | 103,638 | 200,823 | 5,056 | 11,976 | 0 | 5,056 | 4,008 |
| 24 | 56,829 | 240,712 | 7,037 | 14,935 | 0 | 0 | 0 |
| 26 | 40,262 | 247,819 | 0 | 4,078 | 0 | 0 | 0 |
| 28 | 43,548 | 167,760 | 0 | 4,124 | 0 | 0 | 0 |
| 30 + | 35,113 | 168,156 | 0 | 8,341 | 4,264 | 0 | 0 |
| **TOTAL** | **478,348** | **1,611,987** | **126,520** | **59,578** | **14,703** | **27,285** | **17,079** |

| DBH | HD. MAPLE | CUCUMBER | SYCAMORE | BASSWOOD | WH. ASH | BL. BIRCH | BL. OAK |
|---|---|---|---|---|---|---|---|
| 14 | 13,281 | 8,947 | 19,595 | 0 | 0 | 3,565 | 2,656 |
| 16 | 12,955 | 3,705 | 47,392 | 3,705 | 8,411 | 0 | 0 |
| 18 | 15,005 | 0 | 24,745 | 3,775 | 3,775 | 0 | 0 |
| 20 | 6,734 | 0 | 48,744 | 6,710 | 3,891 | 0 | 0 |
| 22 | 14,935 | 0 | 33,016 | 5,056 | 0 | 0 | 0 |
| 24 | 6,920 | 0 | 15,028 | 0 | 0 | 0 | 0 |
| 26 | 4,078 | 0 | 5,196 | 0 | 0 | 0 | 0 |
| 28 | 13,467 | 0 | 6,221 | 0 | 0 | 0 | 0 |
| 30 + | 12,629 | 0 | 5,312 | 0 | 0 | 0 | 4,147 |
| **TOTAL** | **100,004** | **12,652** | **205,249** | **19,246** | **16,077** | **3,565** | **6,803** |

| DBH | MISC. HWDS. | YEL. PINE | TOTAL |
|---|---|---|---|
| 14 | 0 | 3,565 | **166,128** |
| 16 | 7,479 | 7,456 | **341,742** |
| 18 | 0 | 4,800 | **370,309** |
| 20 | 0 | 12,489 | **357,166** |
| 22 | 0 | 0 | **383,564** |
| 24 | 0 | 0 | **341,461** |
| 26 | 0 | 0 | **301,433** |
| 28 | 0 | 0 | **235,120** |
| 30 + | 0 | 0 | **237,962** |
| **TOTAL** | **7,479** | **28,310** | **2,734,885** |

## TABLE # 2 - ESTIMATED SAW TIMBER VOLUMES PER ACRE BY SPECIES & SIZE CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 352.5 | 804.7 | 279.7 | 11.9 | 11.9 | 79.2 |
| LARGE (18" DBH & UP) | 1,700.5 | 6,113.7 | 263.3 | 243.8 | 51.2 | 37.9 |
| **TOTAL** | **2,053.0** | **6,918.4** | **543.0** | **255.7** | **63.1** | **117.1** |

| SPECIES | SFT. MAPLE | HD. MAPLE | CUCUMBER | SYCAMORE | BASSWOOD | WH. ASH |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 27.3 | 112.6 | 54.3 | 287.5 | 15.9 | 36.1 |
| LARGE (18" DBH & UP) | 46.0 | 316.6 | - 0 - | 593.4 | 66.7 | 32.9 |
| **TOTAL** | **73.3** | **429.2** | **54.3** | **880.9** | **82.6** | **69.0** |

| SPECIES | BL. BIRCH | BL. OAK | MISC. HWDS. | YEL. PINE | TOTAL |
|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 15.3 | 11.4 | 32.1 | 47.3 | **2,179.7** |
| LARGE (18" DBH & UP) | - 0 - | 17.8 | - 0 - | 74.2 | **9,558.0** |
| **TOTAL** | **15.3** | **29.2** | **32.1** | **121.5** | **11,737.7** |

## TABLE # 3 - ESTIMATED PULPWOOD VOLUMES BY SPECIES: (IN WEIGHT CORDS)

| SPECIES | VOLUME/ACRE | TOTAL VOLUME |
|---|---|---|
| YEL. POPLAR | 0.74 | 172 |
| WH. PINE | 2.89 | 673 |
| HEMLOCK | 1.23 | 287 |
| RD. OAK | 0.06 | 14 |
| WH. OAK | 0.04 | 9 |
| HICKORY | 0.81 | 189 |
| SFT. MAPLE | 0.34 | 79 |
| HD. MAPLE | 1.35 | 315 |
| CUCUMBER | 0.11 | 26 |
| BEECH | 0.07 | 16 |
| SYCAMORE | 2.07 | 482 |
| BASSWOOD | 0.04 | 9 |
| WH. ASH | 0.07 | 16 |
| BL. BIRCH | 1.18 | 275 |
| CH. OAK | 0.03 | 7 |
| MISC. HWDS. | 0.32 | 75 |
| YEL. PINE | 0.65 | 151 |
| TOTAL | 12.00 | 2,795 |

## TABLE # 4 - ESTIMATED NUMBER OF TREES PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| SAPLING | 8.96 | 7.16 | 8.95 | 10.75 | - 0 - | 7.16 |
| POLE TIMBER | 5.83 | 26.50 | 14.36 | 0.45 | 0.29 | 9.04 |
| SMALL SAW TIMBER | 2.59 | 5.90 | 2.51 | 0.11 | 0.11 | 0.85 |
| LARGE SAW TIMBER | 3.72 | 10.69 | 0.96 | 0.89 | 0.16 | 0.15 |
| **TOTAL** | **21.10** | **50.25** | **26.78** | **12.20** | **0.56** | **17.20** |

| SPECIES | SFT. MAPLE | HD. MAPLE | CUCUMBER | BEECH | SYCAMORE | BASSWOOD |
|---|---|---|---|---|---|---|
| SAPLING | 17.91 | 30.45 | - 0 - | 8.95 | 8.95 | - 0 - |
| POLE TIMBER | 6.20 | 18.23 | 0.85 | 0.45 | 16.86 | 0.20 |
| SMALL SAW TIMBER | 0.26 | 1.18 | 0.40 | - 0 - | 2.91 | 0.11 |
| LARGE SAW TIMBER | 0.31 | 1.15 | - 0 - | 0.06 | 2.08 | 0.22 |
| **TOTAL** | **24.68** | **51.01** | **1.25** | **9.46** | **30.80** | **0.53** |

| SPECIES | WH. ASH | BL. BIRCH | BL. OAK | CH. OAK | MISC. HWDS. | YEL. PINE |
|---|---|---|---|---|---|---|
| SAPLING | 8.96 | 28.66 | - 0 - | - 0 - | 5.37 | 1.79 |
| POLE TIMBER | 0.74 | 17.66 | - 0 - | - 0 - | 5.82 | 6.21 |
| SMALL SAW TIMBER | 0.22 | 0.40 | 0.15 | - 0 - | 0.22 | 0.66 |
| LARGE SAW TIMBER | 0.16 | - 0 - | 0.03 | 0.09 | - 0 - | 0.23 |
| **TOTAL** | **10.08** | **46.72** | **0.18** | **0.09** | **11.41** | **8.89** |

| SPECIES | TOTAL |
|---|---|
| SAPLING | **154.02** |
| POLE TIMBER | **129.69** |
| SMALL SAW TIMBER | **18.58** |
| LARGE SAW TIMBER | **20.90** |
| **TOTAL** | **323.19** |

## TABLE # 5 - ESTIMATED BASAL AREA PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| SAPLING | 0.32 | 0.62 | 0.78 | 0.47 | - 0 - | 0.62 |
| POLE TIMBER | 2.66 | 10.47 | 5.16 | 0.16 | 0.16 | 3.60 |
| SMALL SAW TIMBER | 3.28 | 7.19 | 3.13 | 0.16 | 0.16 | 1.09 |
| LARGE SAW TIMBER | 10.01 | 30.00 | 1.88 | 2.51 | 0.32 | 0.32 |
| **TOTAL** | **16.27** | **48.28** | **10.95** | **3.30** | **0.64** | **5.63** |

| SPECIES | SFT. MAPLE | HD. MAPLE | CUCUMBER | BEECH | SYCAMORE | BASSWOOD |
|---|---|---|---|---|---|---|
| SAPLING | 0.62 | 1.72 | - 0 - | 0.78 | 0.78 | - 0 - |
| POLE TIMBER | 1.72 | 6.40 | 0.47 | 0.16 | 7.66 | 0.16 |
| SMALL SAW TIMBER | 0.32 | 1.40 | 0.47 | - 0 - | 3.59 | 0.16 |
| LARGE SAW TIMBER | 0.63 | 3.13 | - 0 - | 0.16 | 4.85 | 0.48 |
| **TOTAL** | **3.29** | **12.65** | **0.94** | **1.10** | **16.88** | **0.80** |

| SPECIES | WH. ASH | BL. BIRCH | BL. OAK | CH. OAK | MISC. HWDS. | YEL. PINE |
|---|---|---|---|---|---|---|
| SAPLING | 0.32 | 1.56 | - 0 - | - 0 - | 0.48 | 0.16 |
| POLE TIMBER | 0.32 | 5.47 | - 0 - | - 0 - | 1.58 | 2.35 |
| SMALL SAW TIMBER | 0.31 | 0.47 | 0.16 | - 0 - | 0.32 | 0.78 |
| LARGE SAW TIMBER | 0.32 | - 0 - | 0.16 | 0.16 | - 0 - | 0.47 |
| **TOTAL** | **1.27** | **7.50** | **0.32** | **0.16** | **2.38** | **3.76** |

| SPECIES | TOTAL |
|---|---|
| SAPLING | **9.23** |
| POLE TIMBER | **48.50** |
| SMALL SAW TIMBER | **22.99** |
| LARGE SAW TIMBER | **55.40** |
| **TOTAL** | **136.12** |

* MISC. HWDS. INCLUDES BL. LOCUST, BL. GUM & SASSAFRAS.

* YEL. PINE INCLUDES VA. PINE, PITCH PINE & EASTERN RED CEDAR.

* VOLUME ESTIMATES ARE BASED ON A SYSTEMATIC PRISM CRUISE (10 BAF) OF 64 SAMPLE PLOTS.

## MANAGEMENT UNIT 4-A SUMMARY:

**LOCATION:** southwest side of Route 33, from the Dry Run Road northwest to the Skidmore Fork Road

**ACREAGE:** 201 +/- acres of which 178 +/- acres is forest land

**ACCESS:** fair to excellent, access to some areas of will require crossing Dry River, access for other areas can be directly from Route 33, the Dry Run Road provides access to the lower end of unit

**TOPOGRAPHY:** relatively flat terrain, lies mainly in the bottom land area between Route 33 and the base of Dundore Mountain & along Dry Run; over the length of the unit, a distance of approximately 1.8 miles, elevation changes about 140 feet, averaging less than a 2 % slope

**SOILS:** typic udorthents, map unit symbol 70A, good for growing trees

**FOREST:** unit contains some areas that have been recently logged and others that have not, the forest stand that remains is relatively old, fully stocked, mature, averaging 232 trees & 121 square feet of basal area per acre, with saw timber averaging over 10 thousand board feet per acre & pulpwood averaging over 11 cords per acre; total saw timber volume - 1.850 million board feet, primarily white pine (973 thousand board feet), yellow poplar (334 thousand board feet), and hemlock (104 thousand board feet), total pulpwood volume - 2,008 cords; 39 merchantable saw timber trees per acre; tree reproduction is very scarce

**COMMENTS:** unit has some "off road vehicle" trails & camping sites

**RECOMENDATIONS:** 1) put a halt to the "off road vehicle" activity, block most access points to Route 33 with dirt berms (tank traps), install a locked gate on the Dry Run Road & any other needed access points; 2) eliminate & reclaim all unnecessary roads & trails; 3) restrict camping in areas near water courses; 4) a forest stand having long term sustainability should be developed by implementing various silvicultural practices that will vary species composition & stand structure, through a series of combined improvement, single tree & group selection cuttings

# MANAGEMENT UNIT 4 - A

DRY RUN ROAD NORTHWEST TO SKIDMORE FORK ROAD - BOTTOM LAND

**201 +/- ACRES**

**(178 +/- ACRES OF WOODLAND)**

# TIMBER CRUISE REPORT

**TABLE # 1 - ESTIMATEDSAW TIMBER VOLUMES BY SPECIES & DIAMETER CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)**

| DBH | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY | SFT. MAPLE |
|---|---|---|---|---|---|---|---|
| 14 | 47,651 | 45,319 | 28,943 | 0 | 0 | 10,093 | 3,329 |
| 16 | 51,851 | 59,149 | 18,672 | 0 | 0 | 12,834 | 0 |
| 18 | 53,026 | 87,398 | 17,853 | 15,522 | 4,753 | 20,132 | 9,541 |
| 20 | 42,987 | 139,214 | 15,646 | 29,156 | 0 | 6,212 | 3,560 |
| 22 | 64,489 | 170,471 | 16,109 | 21,307 | 10,004 | 0 | 10,039 |
| 24 | 9,363 | 119,349 | 0 | 0 | 0 | 0 | 0 |
| 26 | 24,600 | 115,611 | 6,533 | 10,217 | 0 | 5,109 | 0 |
| 28 | 25,970 | 128,658 | 0 | 5,162 | 3,702 | 0 | 0 |
| 30 + | 13,973 | 108,171 | 0 | 5,251 | 5,251 | 0 | 0 |
| **TOTAL** | **333,910** | **973,340** | **103,756** | **86,615** | **23,710** | **54,380** | **26,469** |

| DBH | HD. MAPLE | CUCUMBER | SYCAMORE | BASSWOOD | WH. ASH | CH. OAK | BL. OAK |
|---|---|---|---|---|---|---|---|
| 14 | 12,282 | 0 | 0 | 18,939 | 0 | 4,468 | 0 |
| 16 | 9,309 | 0 | 24,546 | 9,363 | 4,664 | 0 | 0 |
| 18 | 9,487 | 6,016 | 23,692 | 6,016 | 0 | 10,769 | 4,753 |
| 20 | 18,619 | 6,212 | 0 | 7,262 | 6,212 | 0 | 0 |
| 22 | 0 | 0 | 0 | 0 | 7,494 | 0 | 0 |
| 24 | 6,390 | 0 | 6,390 | 0 | 6,390 | 0 | 6,390 |
| 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 | 5,162 | 0 | 0 | 0 | 0 | 0 | 7,796 |
| 30 + | 6,746 | 0 | 0 | 0 | 0 | 0 | 6,657 |
| **TOTAL** | **67,995** | **12,228** | **54,628** | **41,580** | **24,760** | **15,237** | **25,596** |

| DBH | MISC. HWDS. | TOTAL |
|---|---|---|
| 14 | 0 | **171,024** |
| 16 | 0 | **190,388** |
| 18 | 0 | **268,958** |
| 20 | 6,212 | **281,292** |
| 22 | 0 | **299,913** |
| 24 | 0 | **154,272** |
| 26 | 0 | **162,070** |
| 28 | 0 | **176,450** |
| 30 + | 0 | **146,049** |
| **TOTAL** | **6,212** | **1,850,416** |

## TABLE # 2 - ESTIMATED SAW TIMBER VOLUMES PER ACRE BY SPECIES & SIZE CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 559.0 | 586.9 | 267.5 | - 0 - | - 0 - | 128.8 |
| LARGE (18" DBH & UP) | 1,316.9 | 4,881.3 | 315.4 | 486.6 | 133.2 | 176.7 |
| **TOTAL** | **1,875.9** | **5,468.2** | **582.9** | **486.6** | **133.2** | **305.5** |

| SPECIES | SFT. MAPLE | HD. MAPLE | CUCUMBER | SYCAMORE | BASSWOOD | WH. ASH |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 18.7 | 121.3 | - 0 - | 137.9 | 159.0 | 26.2 |
| LARGE (18" DBH & UP) | 130.0 | 260.7 | 68.7 | 169.0 | 74.6 | 112.9 |
| **TOTAL** | **148.7** | **382.0** | **68.7** | **306.9** | **233.6** | **139.1** |

| SPECIES | CH. OAK | BL. OAK | MISC. HWDS. | TOTAL |
|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 25.1 | - 0 - | - 0 - | **2,030.4** |
| LARGE (18" DBH & UP) | 60.5 | 143.8 | 34.9 | **8,365.2** |
| **TOTAL** | **85.6** | **143.8** | **34.9** | **10,395.6** |

## TABLE # 3 - ESTIMATED PULPWOOD VOLUMES BY SPECIES: (IN WEIGHT CORDS)

| SPECIES | VOLUME/ACRE | TOTAL VOLUME |
|---|---|---|
| YEL. POPLAR | 1.81 | 322 |
| WH. PINE | 1.57 | 279 |
| HEMLOCK | 2.37 | 422 |
| RD. OAK | 0.18 | 32 |
| WH. OAK | 0.17 | 30 |
| HICKORY | 0.69 | 123 |
| SFT. MAPLE | 0.42 | 75 |
| HD. MAPLE | 0.89 | 158 |
| CUCUMBER | 0.09 | 16 |
| BEECH | 0.18 | 32 |
| SYCAMORE | 0.66 | 117 |
| BASSWOOD | 0.36 | 64 |
| WH. ASH | 0.10 | 18 |
| BL. BIRCH | 0.56 | 100 |
| CH. OAK | 0.27 | 48 |
| BL. OAK | 0.12 | 21 |
| MISC. HWDS. | 0.55 | 98 |
| YEL. PINE | 0.30 | 53 |
| TOTAL | 11.29 | 2,008 |

## TABLE # 4 - ESTIMATED NUMBER OF TREES PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| SAPLING | 38.22 | 2.94 | - 0 - | - 0 - | - 0 - | 5.88 |
| POLE TIMBER | 18.08 | 15.16 | 27.86 | 0.65 | 1.31 | 6.47 |
| SMALL SAW TIMBER | 4.59 | 4.96 | 2.89 | - 0 - | 0.37 | 1.03 |
| LARGE SAW TIMBER | 3.21 | 8.25 | 1.08 | 1.69 | 0.45 | 0.92 |
| **TOTAL** | **64.10** | **31.31** | **31.83** | **2.34** | **2.13** | **14.30** |

| SPECIES | SFT. MAPLE | HD. MAPLE | CUCUMBER | BEECH | SYCAMORE | BASSWOOD |
|---|---|---|---|---|---|---|
| SAPLING | - 0 - | 11.76 | - 0 - | 2.94 | - 0 - | - 0 - |
| POLE TIMBER | 3.53 | 16.70 | 1.20 | 3.51 | 6.43 | 4.06 |
| SMALL SAW TIMBER | 0.24 | 1.27 | - 0 - | - 0 - | 1.40 | 1.57 |
| LARGE SAW TIMBER | 0.60 | 0.83 | 0.27 | - 0 - | 0.81 | 0.27 |
| **TOTAL** | **4.37** | **30.56** | **1.47** | **6.45** | **8.64** | **5.90** |

| SPECIES | WH. ASH | BL. BIRCH | CH. OAK | BL. OAK | MISC. HWDS. | YEL. PINE |
|---|---|---|---|---|---|---|
| SAPLING | - 0 - | 2.94 | - 0 - | - 0 - | - 0 - | - 0 - |
| POLE TIMBER | 0.73 | 9.45 | 3.34 | 1.20 | 5.65 | 2.53 |
| SMALL SAW TIMBER | 0.37 | - 0 - | 0.90 | - 0 - | - 0 - | - 0 - |
| LARGE SAW TIMBER | 0.30 | - 0 - | 0.29 | 0.34 | 0.12 | - 0 - |
| **TOTAL** | **1.40** | **12.39** | **4.53** | **1.54** | **5.77** | **2.53** |

| SPECIES | TOTAL |
|---|---|
| SAPLING | **64.68** |
| POLE TIMBER | **127.86** |
| SMALL SAW TIMBER | **19.59** |
| LARGE SAW TIMBER | **19.43** |
| **TOTAL** | **231.56** |

## TABLE # 5 - ESTIMATED BASAL AREA PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| SAPLING | 1.03 | 0.26 | - 0 - | - 0 - | - 0 - | 0.51 |
| POLE TIMBER | 7.18 | 5.39 | 10.25 | 0.51 | 0.26 | 2.56 |
| SMALL SAW TIMBER | 5.38 | 5.89 | 3.34 | - 0 - | 0.51 | 1.28 |
| LARGE SAW TIMBER | 7.95 | 22.33 | 2.31 | 4.11 | 1.29 | 1.80 |
| **TOTAL** | **21.54** | **34.87** | **15.90** | **4.62** | **2.06** | **6.15** |

| SPECIES | SFT. MAPLE | HD. MAPLE | CUCUMBER | BEECH | SYCAMORE | BASSWOOD |
|---|---|---|---|---|---|---|
| SAPLING | - 0 - | 0.26 | - 0 - | 0.26 | - 0 - | - 0 - |
| POLE TIMBER | 1.79 | 4.36 | 0.52 | 1.03 | 2.30 | 1.54 |
| SMALL SAW TIMBER | 0.26 | 1.54 | - 0 - | - 0 - | 1.79 | 1.79 |
| LARGE SAW TIMBER | 1.28 | 2.06 | 0.52 | - 0 - | 1.54 | 0.52 |
| **TOTAL** | **3.33** | **8.22** | **1.04** | **1.29** | **5.63** | **3.85** |

| SPECIES | WH. ASH | BL. BIRCH | CH. OAK | BL. OAK | MISC. HWDS. | YEL. PINE |
|---|---|---|---|---|---|---|
| SAPLING | - 0 - | 0.26 | - 0 - | - 0 - | - 0 - | - 0 - |
| POLE TIMBER | 0.26 | 3.08 | 0.77 | 0.52 | 2.58 | 1.03 |
| SMALL SAW TIMBER | 0.51 | - 0 - | 1.03 | - 0 - | - 0 - | - 0 - |
| LARGE SAW TIMBER | 0.78 | - 0 - | 0.51 | 1.04 | 0.26 | - 0 - |
| **TOTAL** | **1.55** | **3.34** | **2.31** | **1.56** | **2.84** | **1.03** |

| SPECIES | TOTAL |
|---|---|
| SAPLING | **2.58** |
| POLE TIMBER | **45.93** |
| SMALL SAW TIMBER | **23.32** |
| LARGE SAW TIMBER | **49.30** |
| **TOTAL** | **121.13** |

* MISC. HWDS. INCLUDES BL. GUM,  BL. LOCUST, BL. CHERRY, BUTTERNUT & SOURWOOD.

* YEL. PINE INCLUDES VA. PINE & PITCH PINE.

* VOLUME ESTIMATES ARE BASED ON A SYSTEMATIC PRISM CRUISE (10 BAF) OF 39 SAMPLE PLOTS.

## MANAGEMENT UNIT 4-B SUMMARY:

**LOCATION:** southwest of Management Unit 4-A, on the lower northeast slope of Dundore Mountain

**ACREAGE:** 68 +/- acres of which all is forest land

**ACCESS:** poor, presently there is no vehicular access to the unit

**TOPOGRAPHY:** steep, rocky, mountainous terrain; from the bottom of the unit to the top, a distance of approximately 0.4 miles, elevation changes about 680 feet, averaging over a 30 % slope

**SOILS:** in the lower areas, having approximately seventy percent of the acreage in the unit, soils are Lehew, Dekalb, and Calvin, 45 to 65 percent slopes, very stony, map unit symbol 44F; in the upper areas, having approximately thirty percent of the acreage in the unit, soils are Lehew, Dekalb, and Calvin, 25 to 45 percent slope, very stony, map unit symbol 44E; cove soils are good for growing trees, ridge soils are poor to average for growing trees

**FOREST:** a relatively old, moderately stocked forest stand, averaging 312 trees & 82 square feet of basal area per acre, with saw timber averaging over 5 thousand board feet per acre & pulpwood averaging over 7 cords per acre; total saw timber volume - 347 thousand board feet, primarily chestnut oak (101 thousand board feet), basswood (52 thousand board feet), and red oak (42 thousand board feet); total pulpwood volume - 525 cords; some of saw timber is of good quality, some of poor quality; 24 saw timber trees per acre; almost no tree reproduction; a thick growth of mountain laurel in much of the understory

**COMMENTS:** unit is very steep and rocky, in places ledgy, includes two narrow northeast facing hollows, one with a small waterfall & possibly a perennial stream; configuration of unit is not conducive for a properly constructed logging road system

**RECOMENDATIONS:** 1) monitor gypsy moth population; 2) would be a unique area to have a hiking/interpretive trail loop; 3) could harvest a small amount of timber along the lower

# MANAGEMENT UNIT 4 - B

DRY RUN ROAD NORTHWEST TO SKIDMORE FORK ROAD - MOUNTAIN LAND

**68 +/- ACRES OF WOODLAND**

# TIMBER CRUISE REPORT

**TABLE # 1 - ESTIMATEDSAW TIMBER VOLUMES BY SPECIES & DIAMETER CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)**

| DBH | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | HICKORY | SFT. MAPLE | HD. MAPLE |
|---|---|---|---|---|---|---|---|
| 14 | 0 | 0 | 2,156 | 0 | 0 | 0 | 0 |
| 16 | 0 | 3,196 | 3,815 | 9,044 | 0 | 6,827 | 3,815 |
| 18 | 5,617 | 0 | 3,903 | 10,880 | 5,263 | 0 | 0 |
| 20 | 0 | 5,794 | 0 | 4,019 | 0 | 5,440 | 0 |
| 22 | 0 | 0 | 0 | 4,107 | 0 | 0 | 0 |
| 24 | 16,524 | 6,059 | 0 | 0 | 0 | 4,910 | 0 |
| 26 | 0 | 0 | 5,828 | 4,230 | 0 | 0 | 5,828 |
| 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 + | 6,412 | 7,657 | 0 | 9,581 | 0 | 0 | 0 |
| **TOTAL** | **28,553** | **22,706** | **15,702** | **41,861** | **5,263** | **17,177** | **9,643** |

| DBH | CUCUMBER | BASSWOOD | WH. ASH | CH. OAK | BL. BIRCH | YEL. PINE | TOTAL |
|---|---|---|---|---|---|---|---|
| 14 | 2,156 | 2,897 | 0 | 2,156 | 2,156 | 0 | **11,521** |
| 16 | 0 | 15,701 | 0 | 6,032 | 4,495 | 10,642 | **63,567** |
| 18 | 9.166 | 14,668 | 0 | 15,402 | 2,278 | 0 | **67,177** |
| 20 | 4,699 | 5,440 | 0 | 12,478 | 0 | 0 | **37,870** |
| 22 | 0 | 7,364 | 0 | 17,830 | 0 | 0 | **29,301** |
| 24 | 0 | 5,705 | 6,236 | 17,150 | 0 | 0 | **56,584** |
| 26 | 0 | 0 | 0 | 10,853 | 0 | 0 | **26,739** |
| 28 | 0 | 0 | 0 | 4,257 | 0 | 0 | **4,257** |
| 30 + | 11,737 | 0 | 0 | 14,756 | 0 | 0 | **50,143** |
| **TOTAL** | **27,758** | **51,775** | **6,236** | **100,914** | **8,929** | **10,642** | **347,159** |

## TABLE # 2 - ESTIMATED SAW TIMBER VOLUMES PER ACRE BY SPECIES & SIZE CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | HICKORY | SFT. MAPLE |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | - 0 - | 47.0 | 87.8 | 133.0 | - 0 - | 100.4 |
| LARGE (18" DBH & UP) | 419.9 | 286.9 | 143.1 | 482.6 | 77.4 | 152.2 |
| **TOTAL** | **419.9** | **333.9** | **230.9** | **615.6** | **77.4** | **252.6** |

| SPECIES | HD. MAPLE | CUCUMBER | BASSWOOD | WH. ASH | BL. BIRCH | CH. OAK |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 56.1 | 31.7 | 273.5 | - 0 - | 97.8 | 120.4 |
| LARGE (18" DBH & UP) | 85.7 | 376.5 | 487.9 | 91.7 | 33.5 | 1,363.6 |
| **TOTAL** | **141.8** | **408.2** | **761.4** | **91.7** | **131.3** | **1,484.0** |

| SPECIES | YEL. PINE | TOTAL |
|---|---|---|
| SMALL (14 - 16" DBH) | 156.5 | **1,104.2** |
| LARGE (18" DBH & UP) | - 0 - | **4,001.0** |
| **TOTAL** | **156.5** | **5,105.2** |

## TABLE # 3 - ESTIMATED PULPWOOD VOLUMES BY SPECIES: (IN WEIGHT CORDS)

| SPECIES | VOLUME/ACRE | TOTAL VOLUME |
|---|---|---|
| HEMLOCK | 0.91 | 62 |
| RD. OAK | 1.00 | 68 |
| HICKORY | 0.11 | 7 |
| SFT. MAPLE | 1.58 | 107 |
| HD. MAPLE | 0.10 | 7 |
| CUCUMBER | 0.06 | 4 |
| BEECH | 0.11 | 7 |
| BASSWOOD | 0.29 | 20 |
| BL. BIRCH | 0.68 | 46 |
| CH. OAK | 2.25 | 153 |
| MISC. HWDS. | 0.56 | 38 |
| YEL. PINE | 0.09 | 6 |
| TOTAL | 7.74 | 525 |

## TABLE # 4 - ESTIMATED NUMBER OF TREES PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | HICKORY | SFT. MAPLE |
|---|---|---|---|---|---|---|
| SAPLING | - 0 - | - 0 - | - 0 - | 24.92 | 4.98 | 69.79 |
| POLE TIMBER | - 0 - | - 0 - | 14.56 | 13.18 | 1.25 | 16.81 |
| SMALL SAW TIMBER | - 0 - | 0.31 | 0.41 | 0.93 | - 0 - | 1.43 |
| LARGE SAW TIMBER | 0.74 | 0.23 | 0.37 | 1.37 | 0.25 | 0.75 |
| **TOTAL** | **0.74** | **0.54** | **15.34** | **40.40** | **6.48** | **88.78** |

| SPECIES | HD. MAPLE | CUCUMBER | BEECH | BASSWOOD | WH. ASH | BL. BIRCH |
|---|---|---|---|---|---|---|
| SAPLING | 9.97 | 4.98 | - 0 - | - 0 - | - 0 - | - 0 - |
| POLE TIMBER | 0.80 | 1.25 | - 0 - | 2.39 | - 0 - | 4.26 |
| SMALL SAW TIMBER | 0.31 | 0.41 | 0.31 | 1.66 | - 0 - | 2.15 |
| LARGE SAW TIMBER | 0.12 | 0.87 | - 0 - | 1.65 | 0.14 | 0.39 |
| **TOTAL** | **11.20** | **7.51** | **0.31** | **5.70** | **0.14** | **6.80** |

| SPECIES | CH. OAK | MISC. HWDS. | YEL. PINE | TOTAL |
|---|---|---|---|---|
| SAPLING | - 0 - | 74.77 | 19.94 | **209.35** |
| POLE TIMBER | 13.58 | 10.46 | 0.55 | **79.09** |
| SMALL SAW TIMBER | 2.06 | - 0 - | 0.93 | **10.91** |
| LARGE SAW TIMBER | 5.87 | 0.25 | - 0 - | **13.00** |
| **TOTAL** | **21.51** | **85.48** | **21.42** | **312.35** |

## TABLE # 5 - ESTIMATED BASAL AREA PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | HICKORY | SFT. MAPLE |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | - 0 - | - 0 - | 0.86 | 0.43 | 2.17 |
| **POLE TIMBER** | - 0 - | - 0 - | 4.77 | 5.21 | 0.43 | 5.65 |
| **SMALL SAW TIMBER** | - 0 - | 0.43 | 0.43 | 1.30 | - 0 - | 1.74 |
| **LARGE SAW TIMBER** | 2.16 | 0.86 | 0.86 | 3.46 | 0.43 | 1.72 |
| **TOTAL** | **2.16** | **1.29** | **6.06** | **10.83** | **1.29** | **11.28** |

| SPECIES | HD. MAPLE | CUCUMBER | BEECH | BASSWOOD | WH. ASH | BL. BIRCH |
|---|---|---|---|---|---|---|
| **SAPLING** | 0.87 | 0.43 | - 0 - | - 0 - | - 0 - | - 0 - |
| **POLE TIMBER** | 0.43 | 0.43 | - 0 - | 1.30 | - 0 - | 1.29 |
| **SMALL SAW TIMBER** | 0.43 | 0.43 | 0.43 | 2.17 | - 0 - | 2.60 |
| **LARGE SAW TIMBER** | 0.43 | 2.17 | - 0 - | 3.47 | 0.43 | 0.86 |
| **TOTAL** | **2.16** | **3.46** | **0.43** | **6.94** | **0.43** | **4.75** |

| SPECIES | CH. OAK | MISC. HWDS. | YEL. PINE | TOTAL |
|---|---|---|---|---|
| **SAPLING** | - 0 - | 2.60 | 0.43 | **7.79** |
| **POLE TIMBER** | 5.65 | 2.60 | 0.43 | **28.19** |
| **SMALL SAW TIMBER** | 2.61 | - 0 - | 1.30 | **13.87** |
| **LARGE SAW TIMBER** | 14.77 | 0.43 | - 0 - | **32.05** |
| **TOTAL** | **23.03** | **5.63** | **2.16** | **81.90** |

* MISC. HWDS. INCLUDES BL. GUM & HORNBEAM.

* YEL. PINE INCLUDES VA. PINE & PITCH PINE.

* VOLUME ESTIMATES ARE BASED ON A SYSTEMATIC PRISM CRUISE (10 BAF) OF 23 SAMPLE PLOTS.

## MANAGEMENT UNIT 5-A SUMMARY:

**LOCATION:** Skidmore fork

**ACREAGE:** 238 +/- acres of which 150 +/- acres is forest land & 88 +/- acres is Switzer Lake/ Dam

**ACCESS:** excellent, Skidmore Fork Road runs up Skidmore Fork to the lower side of Switzer Dam & Switzer Lake Road, a U. S. Forest Service road, crosses the unit above Switzer Lake

**TOPOGRAPHY:** relatively flat terrain, lies mainly in the bottom land area along Skidmore Fork , over the length of the unit, a distance of approximately 2.5 miles, elevation changes about 220 feet, average less than a 2 % slope

**SOILS:** typic udorthents, map unit symbol 70A, good for growing trees

**FOREST:** with the exception of areas on the ends of the unit (above Switzer Lake & near Route 33), much of unit was logged over heavily last year; the forest stand in the unlogged areas is relatively old, heavily stocked & mature; timber cruise figures combine volumes for both logged & unlogged areas & while these figures are a good representation of the volumes present on the whole unit, they do not accurately represent either the logged or unlogged areas individually; the unit averages 127 trees & 83 square feet of basal area per acre, with saw timber averaging almost 8 thousand board feet per acre & pulpwood averaging over 6 cords per acre; total saw timber volume - 1.197 million board feet, primarily white pine (646 thousand board feet), hemlock (140 thousand board feet), and sycamore (106 thousand board feet), total pulpwood volume - 1,004 cords;
29 merchantable saw timber trees per acre; tree reproduction is lacking

**COMMENTS:** Skidmore Fork Road is gated, only access for public into the lower end of unit is by walking, except for a small area next to Route 33, some camp sites in this area: Switzer Dam Road open to upper end of unit, lots of activity by public around Switzer Lake, several campfire sites, camping supposedly prohibited; a significant number of trees were uprooted below Switzer Dam by high winds last year, necessitating a salvage harvest, the cut was very heavy & many residual trees have also been uprooted, now pretty much looks like a clear cut; acceptable buffer strips were left along water courses, but my feelings are that they should have been wider & had fewer trees removed from them

**RECOMENDATIONS:** 1) enforce camping restrictions around Switzer Lake; 2) restrict camping in areas near water courses; 3) monitor regeneration in the cut over area, take action to control tree density & species composition if warranted

# MANAGEMENT UNIT 5 - A

SKIDMORE FORK - BOTTOM LAND

**238 +/- ACRES**

**(150 +/- ACRES OF WOODLAND)**

# TIMBER CRUISE REPORT

**TABLE # 1 - ESTIMATED SAW TIMBER VOLUMES BY SPECIES & DIAMETER CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)**

| DBH | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY | SFT. MAPLE |
|---|---|---|---|---|---|---|---|
| 14 | 8,265 | 24,705 | 14,475 | 3,420 | 3,420 | 17,100 | 5,970 |
| 16 | 16,890 | 57,525 | 41,790 | 3,555 | 0 | 4,500 | 6,210 |
| 18 | 15,390 | 69,870 | 14,550 | 0 | 3,630 | 8,235 | 5,400 |
| 20 | 10,050 | 123,525 | 27,840 | 0 | 3,735 | 0 | 0 |
| 22 | 0 | 95,760 | 19,260 | 4,845 | 6,630 | 0 | 4,845 |
| 24 | 0 | 88,290 | 4,890 | 5,790 | 12,555 | 0 | 2,820 |
| 26 | 5,265 | 75,000 | 5,925 | 0 | 4,995 | 0 | 0 |
| 28 | 0 | 43,080 | 5,970 | 5,025 | 0 | 0 | 0 |
| 30 + | 11,865 | 67,845 | 5,160 | 10,875 | 0 | 0 | 0 |
| **TOTAL** | **67,725** | **645,600** | **139,860** | **33,510** | **34,965** | **29,835** | **25,245** |

| DBH | HD. MAPLE | BL. OAK | BEECH | SYCAMORE | BASSWOOD | BL. BIRCH | CH. OAK |
|---|---|---|---|---|---|---|---|
| 14 | 2,550 | 0 | 0 | 6,840 | 6,840 | 3,420 | 0 |
| 16 | 0 | 3,555 | 0 | 8,055 | 6,210 | 0 | 0 |
| 18 | 3,630 | 0 | 0 | 22,845 | 15,420 | 4,605 | 2,685 |
| 20 | 13,920 | 3,735 | 0 | 19,785 | 0 | 0 | 0 |
| 22 | 2,790 | 3,840 | 0 | 38,505 | 0 | 3,840 | 0 |
| 24 | 3,840 | 0 | 0 | 4,890 | 2,790 | 0 | 0 |
| 26 | 0 | 0 | 2,820 | 4,995 | 0 | 0 | 0 |
| 28 | 5,025 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 + | 7,950 | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | **39,705** | **11,130** | **2,820** | **105,915** | **31,260** | **11,865** | **2,685** |

| DBH | MISC. HWDS. | YEL. PINE | TOTAL |
|---|---|---|---|
| 14 | 3,420 | 0 | **100,425** |
| 16 | 0 | 9,000 | **157,290** |
| 18 | 0 | 0 | **166,260** |
| 20 | 2,715 | 0 | **205,305** |
| 22 | 0 | 0 | **180,315** |
| 24 | 0 | 0 | **125,865** |
| 26 | 0 | 0 | **99,000** |
| 28 | 0 | 0 | **59,100** |
| 30 + | 0 | 0 | **103,695** |
| **TOTAL** | **6,135** | **9,000** | **1,197,255** |

**TABLE # 2 - ESTIMATED SAW TIMBER VOLUMES PER ACRE BY SPECIES & SIZE CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)**

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 167.7 | 548.2 | 375.1 | 46.5 | 22.8 | 144.0 |
| LARGE (18" DBH & UP) | 283.8 | 3,755.8 | 557.3 | 176.9 | 210.3 | 54.9 |
| **TOTAL** | **451.5** | **4,304.0** | **932.4** | **223.4** | **233.1** | **198.9** |

| SPECIES | SFT. MAPLE | HD. MAPLE | BEECH | SYCAMORE | BASSWOOD | BL. OAK |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 81.2 | 17.0 | - 0 - | 99.3 | 87.0 | 23.7 |
| LARGE (18" DBH & UP) | 87.1 | 247.7 | 18.8 | 606.8 | 121.4 | 50.5 |
| **TOTAL** | **168.3** | **264.7** | **18.8** | **706.1** | **208.4** | **74.2** |

| SPECIES | BL. BIRCH | CH. OAK | MISC. HWDS. | YEL. PINE | TOTAL |
|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 22.8 | - 0 - | 22.8 | 60.0 | **1,718.1** |
| LARGE (18" DBH & UP) | 56.3 | 17.9 | 18.1 | - 0 - | **6,263.6** |
| **TOTAL** | **79.1** | **17.9** | **40.9** | **60.0** | **7,981.7** |

**TABLE # 3 - ESTIMATED PULPWOOD VOLUMES BY SPECIES: (IN WEIGHT CORDS)**

| SPECIES | VOLUME/ACRE | TOTAL VOLUME |
|---|---|---|
| YEL. POPLAR | 0.52 | 78 |
| WH. PINE | 1.31 | 196 |
| HEMLOCK | 0.99 | 148 |
| RD. OAK | 0.11 | 16 |
| WH. OAK | 0.05 | 8 |
| HICKORY | 1.49 | 224 |
| SFT. MAPLE | 0.46 | 69 |
| HD. MAPLE | 0.76 | 114 |
| CUCUMBER | 0.18 | 27 |
| BEECH | 0.05 | 8 |
| SYCAMORE | 0.22 | 33 |
| BASSWOOD | 0.05 | 8 |
| BL. BIRCH | 0.40 | 60 |
| CH. OAK | 0.10 | 15 |
| TOTAL | 6.69 | 1,004 |

## TABLE # 4 - ESTIMATED NUMBER OF TREES PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| SAPLING | - 0 - | 2.67 | - 0 - | - 0 - | 2.67 | 10.66 |
| POLE TIMBER | 5.17 | 11.91 | 10.63 | 0.30 | 0.30 | 14.62 |
| SMALL SAW TIMBER | 1.27 | 3.35 | 2.98 | 0.61 | 0.22 | 1.26 |
| LARGE SAW TIMBER | 0.75 | 6.46 | 1.74 | 0.33 | 0.70 | 0.26 |
| **TOTAL** | **7.19** | **24.39** | **15.35** | **1.24** | **3.89** | **26.80** |

| SPECIES | SFT. MAPLE | HD. MAPLE | CUCUMBER | BEECH | SYCAMORE | BASSWOOD |
|---|---|---|---|---|---|---|
| SAPLING | 2.67 | 16.00 | - 0 - | - 0 - | - 0 - | - 0 - |
| POLE TIMBER | 5.37 | 8.98 | 1.02 | - 0 - | 0.43 | - 0 - |
| SMALL SAW TIMBER | 1.20 | 0.39 | - 0 - | 0.17 | 1.11 | 0.77 |
| LARGE SAW TIMBER | 0.28 | 0.86 | - 0 - | 0.06 | 2.06 | 0.55 |
| **TOTAL** | **9.52** | **26.23** | **1.02** | **0.23** | **3.60** | **1.32** |

| SPECIES | BL. OAK | BL. BIRCH | CH. OAK | MISC. HWDS. | YEL. PINE | TOTAL |
|---|---|---|---|---|---|---|
| SAPLING | - 0 - | - 0 - | - 0 - | - 0 - | - 0 - | **34.67** |
| POLE TIMBER | - 0 - | 3.44 | 0.85 | - 0 - | - 0 - | **63.02** |
| SMALL SAW TIMBER | 0.17 | 0.44 | - 0 - | 0.22 | 0.33 | **14.49** |
| LARGE SAW TIMBER | 0.20 | 0.22 | 0.13 | 0.11 | - 0 - | **14.71** |
| **TOTAL** | **0.37** | **4.10** | **0.98** | **0.33** | **0.33** | **126.89** |

## TABLE # 5 - ESTIMATED BASAL AREA PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | 0.23 | - 0 - | - 0 - | 0.23 | 0.93 |
| **POLE TIMBER** | 2.09 | 4.88 | 4.19 | 0.23 | 0.23 | 6.05 |
| **SMALL SAW TIMBER** | 1.63 | 4.19 | 3.73 | 0.70 | 0.23 | 1.39 |
| **LARGE SAW TIMBER** | 1.86 | 17.44 | 4.18 | 1.39 | 1.86 | 0.47 |
| **TOTAL** | **5.58** | **26.74** | **12.10** | **2.32** | **2.55** | **8.84** |

| SPECIES | SFT. MAPLE | HD. MAPLE | CUCUMBER | BEECH | SYCAMORE | BASSWOOD |
|---|---|---|---|---|---|---|
| **SAPLING** | 0.23 | 0.70 | - 0 - | - 0 - | - 0 - | - 0 - |
| **POLE TIMBER** | 1.63 | 3.49 | 0.70 | - 0 - | 0.23 | - 0 - |
| **SMALL SAW TIMBER** | 1.40 | 0.46 | - 0 - | 0.23 | 1.40 | 0.94 |
| **LARGE SAW TIMBER** | 0.69 | 2.32 | - 0 - | 0.23 | 4.65 | 1.16 |
| **TOTAL** | **3.95** | **6.97** | **0.70** | **0.46** | **6.28** | **2.10** |

| SPECIES | BL. OAK | BL. BIRCH | CH. OAK | MISC. HWDS. | YEL. PINE | TOTAL |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | - 0 - | - 0 - | - 0 - | - 0 - | **2.32** |
| **POLE TIMBER** | - 0 - | 1.64 | 0.47 | - 0 - | - 0 - | **25.83** |
| **SMALL SAW TIMBER** | 0.23 | 0.47 | - 0 - | 0.23 | 0.47 | **17.70** |
| **LARGE SAW TIMBER** | 0.46 | 0.46 | 0.23 | 0.23 | - 0 - | **37.63** |
| **TOTAL** | **0.69** | **2.57** | **0.70** | **0.46** | **0.47** | **83.48** |

* MISC. HWDS. IS BL. LOCUST.

* YEL. PINE INCLUDES VA. PINE & PITCH PINE.

* VOLUME ESTIMATES ARE BASED ON A SYSTEMATIC PRISM CRUISE (10 BAF) OF 43 SAMPLE PLOTS.

## MANAGEMENT UNIT 5-B SUMMARY:

**LOCATION:** on the south side of Route 33; north of Management Unit 5-A; at the base of Middle Mountain

**ACREAGE:** 37 +/- acres of which all is forest land

**ACCESS:** poor; considerable frontage along Route 33, but most is very steep; an old road provides access to Route 33 at the eastern end of unit; steep bluff on lower edge of unit adjacent to Management Unit 5-A limits access down the mountain; configuration of unit may not permit a properly constructed logging road system

**TOPOGRAPHY:** steep, rocky, mountainous terrain; includes two narrow south facing hollows; from the lower edge to the top of unit, a distance of approximately 0.3 miles, elevation changes about 440 feet, averaging over a 26 % slope

**SOILS:** Lehew, Dekalb, and Calvin soils, 45 to 65 percent slopes, very stony, map unit symbol 44F; cove soils are fair to good for growing trees, ridge soils are poor for growing trees

**FOREST:** a relatively old, moderately stocked forest stand, averaging 382 trees & 94 square feet of basal area per acre, with saw timber averaging almost 3 thousand board feet per acre & pulpwood averaging over 12 cords per acre; total saw timber volume - 101 thousand board feet, primarily chestnut oak (30 thousand board feet), white oak (26 thousand board feet), and red oak (13 thousand board feet); total pulpwood volume - 463 cords; 26 merchantable saw timber trees per acre; tree reproduction is very low; a thick growth of mountain laurel in many areas; a poor timber growing site

**COMMENTS:** a rough mountain unit with little potential for timber, a considerable amount of trash, tires, etc. being thrown from Route 33 into unit

**RECOMENDATIONS:** 1) stop trash being thrown from Route 33; 2) monitor gypsy moth population; 3) manage unit as a scenic viewshed area

# MANAGEMENT UNIT 5 - B

SKIDMORE FORK - MOUNTAIN LAND

**37 +/- ACRES OF WOODLAND**

# TIMBER CRUISE REPORT

**TABLE # 1 - ESTIMATED SAW TIMBER VOLUMES BY SPECIES & DIAMETER CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)**

| DBH | YEL. POPLAR | WH. PINE | RD. OAK | WH. OAK | BL. OAK | SCLT. OAK | HICKORY |
|---|---|---|---|---|---|---|---|
| 14 | 0 | 2,405 | 3,023 | 4,503 | 2,250 | 0 | 0 |
| 16 | 0 | 0 | 0 | 8,632 | 0 | 10,297 | 0 |
| 18 | 0 | 0 | 0 | 10,482 | 0 | 0 | 4,070 |
| 20 | 0 | 3,515 | 7,492 | 0 | 0 | 0 | 0 |
| 22 | 0 | 0 | 2,468 | 2,468 | 0 | 0 | 0 |
| 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 | 6,505 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 + | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | **6,505** | **5,920** | **12,983** | **26,085** | **2,250** | **10,297** | **4,070** |

| DBH | CH. OAK | MISC. HWDS. | TOTAL |
|---|---|---|---|
| 14 | 6,042 | 0 | **18,223** |
| 16 | 7,955 | 0 | **26,884** |
| 18 | 8,788 | 3,208 | **26,548** |
| 20 | 0 | 0 | **11,007** |
| 22 | 3,393 | 0 | **8,329** |
| 24 | 3,393 | 0 | **3,393** |
| 26 | 0 | 0 | **0** |
| 28 | 0 | 0 | **6,505** |
| 30 + | 0 | 0 | **0** |
| **TOTAL** | **29,571** | **3,208** | **100,889** |

**TABLE # 2 - ESTIMATED SAW TIMBER VOLUMES PER ACRE BY SPECIES & SIZE CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)**

| SPECIES | YEL. POPLAR | WH. PINE | RD. OAK | WH. OAK | BL. OAK | SCLT. OAK |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | - 0 - | 65.0 | 81.7 | 355.0 | 60.8 | 278.3 |
| LARGE (18" DBH & UP) | 175.8 | 95.0 | 269.2 | 350.0 | - 0 - | - 0 - |
| **TOTAL** | **175.8** | **160.0** | **350.9** | **705.0** | **60.8** | **278.3** |

| SPECIES | HICKORY | CH. OAK | MISC. HWDS. | TOTAL |
|---|---|---|---|---|
| SMALL (14 - 16" DBH) | - 0 - | 378.3 | - 0 - | **1,219.1** |
| LARGE (18" DBH & UP) | 110.0 | 420.9 | 86.7 | **1,507.6** |
| **TOTAL** | **110.0** | **799.2** | **86.7** | **2,726.7** |

**TABLE # 3 - ESTIMATED PULPWOOD VOLUMES BY SPECIES: (IN WEIGHT CORDS)**

| SPECIES | VOLUME/ACRE | TOTAL VOLUME |
|---|---|---|
| YEL. POPLAR | 0.22 | 8 |
| WH. PINE | 0.50 | 18 |
| HEMLOCK | 0.30 | 11 |
| RD. OAK | 0.20 | 7 |
| WH. OAK | 0.73 | 27 |
| BL. OAK | 0.41 | 15 |
| SCLT. OAK | 0.97 | 36 |
| HICKORY | 0.33 | 12 |
| SFT. MAPLE | 2.12 | 78 |
| BASSWOOD | 0.20 | 7 |
| CH. OAK | 6.07 | 225 |
| MISC. HWDS. | 0.34 | 13 |
| YEL. PINE | 0.17 | 6 |
| TOTAL | 12.56 | 463 |

## TABLE # 4 - ESTIMATED NUMBER OF TREES PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | BL. OAK |
|---|---|---|---|---|---|---|
| SAPLING | - 0 - | 9.55 | - 0 - | - 0 - | - 0 - | - 0 - |
| POLE TIMBER | 1.06 | 10.02 | 3.45 | - 0 - | 7.84 | 1.53 |
| SMALL SAW TIMBER | - 0 - | 0.78 | - 0 - | 1.56 | 3.35 | 0.78 |
| LARGE SAW TIMBER | 0.20 | 0.38 | - 0 - | 1.09 | 1.73 | 0.32 |
| **TOTAL** | **1.26** | **20.73** | **3.45** | **2.65** | **12.92** | **2.63** |

| SPECIES | SCLT. OAK | HICKORY | SFT. MAPLE | SYCAMORE | BASSWOOD | CH. OAK |
|---|---|---|---|---|---|---|
| SAPLING | - 0 - | 47.77 | 47.77 | - 0 - | - 0 - | - 0 - |
| POLE TIMBER | 9.28 | 6.63 | 32.17 | - 0 - | 2.39 | 47.58 |
| SMALL SAW TIMBER | 1.79 | - 0 - | - 0 - | - 0 - | - 0 - | 7.48 |
| LARGE SAW TIMBER | - 0 - | 0.47 | - 0 - | 0.38 | - 0 - | 3.95 |
| **TOTAL** | **11.07** | **54.87** | **79.94** | **0.38** | **2.39** | **59.01** |

| SPECIES | MISC. HWDS. | YEL. PINE | TOTAL |
|---|---|---|---|
| SAPLING | 124.20 | - 0 - | **229.29** |
| POLE TIMBER | 5.30 | - 0 - | **127.25** |
| SMALL SAW TIMBER | - 0 - | 0.78 | **16.52** |
| LARGE SAW TIMBER | 0.47 | - 0 - | **8.99** |
| **TOTAL** | **129.97** | **0.78** | **382.05** |

## TABLE # 5 - ESTIMATED BASAL AREA PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | BL. OAK |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | 0.83 | - 0 - | - 0 - | - 0 - | - 0 - |
| **POLE TIMBER** | 0.83 | 2.50 | 1.66 | - 0 - | 3.34 | 0.83 |
| **SMALL SAW TIMBER** | - 0 - | 0.83 | - 0 - | 1.67 | 4.17 | 0.83 |
| **LARGE SAW TIMBER** | 0.83 | 0.83 | - 0 - | 2.50 | 3.33 | 0.83 |
| **TOTAL** | **1.66** | **4.99** | **1.66** | **4.17** | **10.84** | **2.49** |

| SPECIES | SCLT. OAK | HICKORY | SFT. MAPLE | SYCAMORE | BASSWOOD | CH. OAK |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | 1.66 | 1.66 | - 0 - | - 0 - | - 0 - |
| **POLE TIMBER** | 4.17 | 1.66 | 9.99 | - 0 - | 0.83 | 19.99 |
| **SMALL SAW TIMBER** | 2.50 | - 0 - | - 0 - | - 0 - | - 0 - | 9.17 |
| **LARGE SAW TIMBER** | - 0 - | 0.83 | - 0 - | 0.83 | - 0 - | 8.33 |
| **TOTAL** | **6.67** | **4.15** | **11.65** | **0.83** | **0.83** | **37.49** |

| SPECIES | MISC. HWDS. | YEL. PINE | TOTAL |
|---|---|---|---|
| **SAPLING** | 3.33 | - 0 - | **7.48** |
| **POLE TIMBER** | 1.66 | - 0 - | **47.46** |
| **SMALL SAW TIMBER** | - 0 - | 0.83 | **20.00** |
| **LARGE SAW TIMBER** | 0.83 | - 0 - | **19.14** |
| **TOTAL** | **5.82** | **0.83** | **94.08** |

* MISC. HWDS. INCLUDES BL. GUM & SOURWOOD.

* YEL. PINE INCLUDES VA. PINE & PITCH PINE.

* VOLUME ESTIMATES ARE BASED ON A SYSTEMATIC PRISM CRUISE (10 BAF) OF 12 SAMPLE PLOTS.

## MANAGEMENT UNIT 6-A SUMMARY:

**LOCATION:** northeast side of Route 33, between Route 33 & Dry River

**ACREAGE:** 52 +/- acres of which all is forest land

**ACCESS:** excellent, several woods road entrances to Route 33

**TOPOGRAPHY:** relatively flat terrain, lies in the bottom land area; over the length of the unit, a distance of approximately 1.0 miles, elevation changes about 70 feet, averaging slope less than a 2 % slope

**SOILS:** typic udorthents, map unit symbol 70A, good for growing trees

**FOREST:** a relatively old, over stocked, mature forest stand, averaging 265 trees & 177 square feet of basal area per acre, with saw timber averaging almost 20 thousand board feet per acre & pulpwood averaging over 15 cords per acre; total saw timber volume - 1.023 million board feet, primarily white pine (470 thousand board feet), yellow poplar (283 thousand board feet), and hemlock (74 thousand board feet), total pulpwood volume - 799 cords; 57 merchantable saw timber trees per acre; over 4/10 of merchantable trees on unit are hemlock; no tree reproduction

**COMMENTS:** unit has several heavily used "off road vehicle" trails & camping sites

**RECOMENDATIONS:** 1) put a halt to the "off road vehicle" activity, block most access points to Route 33 with dirt berms (tank traps), install locked gates at needed access points; 2) eliminate all unnecessary roads & trails; 3) restrict camping in areas near water courses; 4) the hemlock woolly adelgid will have a significant impact on this forest stand & some of these trees should be salvaged before they are of no value; 5) a forest stand having long term sustainability should be developed by implementing various silvicultural treatments that will vary species composition & stand structure, through a series of combined improvement, single tree & group selection cuttings

# MANAGEMENT UNIT 6 - A

TOWER HILL - BOTTOM LAND

**52 +/- ACRES OF WOODLAND**

# TIMBER CRUISE REPORT

**TABLE # 1 - ESTIMATED SAW TIMBER VOLUMES BY SPECIES & DIAMETER CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)**

| DBH | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY | SFT. MAPLE |
|---|---|---|---|---|---|---|---|
| 14 | 0 | 10,920 | 19,068 | 5,060 | 3,396 | 0 | 0 |
| 16 | 14,144 | 46,696 | 3,536 | 0 | 10,644 | 4,472 | 8,944 |
| 18 | 30,992 | 39,764 | 26,140 | 8,180 | 20,972 | 0 | 4,576 |
| 20 | 26,692 | 86,772 | 12,756 | 16,604 | 14,804 | 0 | 5,512 |
| 22 | 57,512 | 48,500 | 6,552 | 5,684 | 8,460 | 5,684 | 2,772 |
| 24 | 47,944 | 52,556 | 0 | 5,756 | 0 | 0 | 0 |
| 26 | 44,372 | 84,828 | 0 | 4,956 | 0 | 0 | 0 |
| 28 | 32,412 | 65,172 | 0 | 6,900 | 0 | 0 | 0 |
| 30 + | 28,569 | 35,220 | 6,032 | 6,032 | 0 | 0 | 0 |
| **TOTAL** | **282,637** | **470,428** | **74,084** | **59,172** | **58,276** | **10,156** | **21,804** |

| DBH | HD. MAPLE | SYCAMORE | CUCUMBER | WH. ASH | TOTAL |
|---|---|---|---|---|---|
| 14 | 3,396 | 4,264 | 0 | 0 | **46,104** |
| 16 | 3,536 | 0 | 5,200 | 0 | **97,172** |
| 18 | 8,980 | 4,576 | 0 | 0 | **144,180** |
| 20 | 0 | 0 | 0 | 5,512 | **168,652** |
| 22 | 0 | 0 | 7,244 | 0 | **142,408** |
| 24 | 0 | 0 | 0 | 0 | **106,256** |
| 26 | 0 | 0 | 0 | 0 | **134,156** |
| 28 | 3,916 | 0 | 0 | 0 | **108,400** |
| 30 + | 0 | 0 | 0 | 0 | **75,853** |
| **TOTAL** | **19,828** | **8,840** | **12,444** | **5,512** | **1,023,181** |

**TABLE # 2 - ESTIMATED SAW TIMBER VOLUMES PER ACRE BY SPECIES & SIZE CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)**

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 272.0 | 1,108.0 | 434.7 | 97.3 | 270.0 | 86.0 |
| LARGE (18" DBH & UP) | 5,163.3 | 7,938.7 | 990.0 | 1,040.6 | 850.7 | 109.3 |
| **TOTAL** | **5,435.3** | **9,046.7** | **1,424.7** | **1,137.9** | **1,120.7** | **195.3** |

| SPECIES | SFT. MAPLE | HD. MAPLE | SYCAMORE | CUCUMBER | WH. ASH | TOTAL |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 172.0 | 133.3 | 82.0 | 100.0 | - 0 - | **2,755.3** |
| LARGE (18" DBH & UP) | 247.3 | 248.0 | 88.0 | 139.3 | 106.0 | **16,921.2** |
| **TOTAL** | **419.3** | **381.3** | **170.0** | **239.3** | **106.0** | **19,676.5** |

**TABLE # 3 - ESTIMATED PULPWOOD VOLUMES BY SPECIES: (IN WEIGHT CORDS)**

| SPECIES | VOLUME/ACRE | TOTAL VOLUME |
|---|---|---|
| YEL. POPLAR | 1.64 | 85 |
| WH. PINE | 1.95 | 101 |
| HEMLOCK | 6.73 | 350 |
| RD. OAK | 0.45 | 23 |
| HICKORY | 1.03 | 54 |
| SFT. MAPLE | 1.07 | 56 |
| HD. MAPLE | 0.25 | 13 |
| SYCAMORE | 0.85 | 44 |
| CH. OAK | 0.16 | 8 |
| BL. BIRCH | 0.56 | 29 |
| BEECH | 0.31 | 16 |
| YEL. PINE | 0.39 | 20 |
| TOTAL | 15.39 | 799 |

## TABLE # 4 - ESTIMATED NUMBER OF TREES PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | - 0 - | 45.85 | 7.64 | - 0 - | - 0 - |
| **POLE TIMBER** | 15.62 | 13.81 | 83.69 | 3.61 | - 0 - | 7.28 |
| **SMALL SAW TIMBER** | 1.43 | 6.94 | 4.22 | 1.25 | 2.05 | 0.48 |
| **LARGE SAW TIMBER** | 9.07 | 12.47 | 3.95 | 2.61 | 3.32 | 0.25 |
| **TOTAL** | **26.12** | **33.22** | **137.71** | **15.11** | **5.37** | **8.01** |

| SPECIES | SFT. MAPLE | HD. MAPLE | SYCAMORE | CH. OAK | CUCUMBER | WH. ASH |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | - 0 - | - 0 - | - 0 - | - 0 - | - 0 - |
| **POLE TIMBER** | 8.40 | 3.40 | 5.21 | 0.85 | - 0 - | - 0 - |
| **SMALL SAW TIMBER** | 1.57 | 1.73 | 1.25 | - 0 - | 0.48 | - 0 - |
| **LARGE SAW TIMBER** | 0.94 | 0.91 | 0.38 | - 0 - | 0.25 | 0.31 |
| **TOTAL** | **10.91** | **6.04** | **6.84** | **0.85** | **0.73** | **0.31** |

| SPECIES | BL. BIRCH | BEECH | YEL. PINE | TOTAL |
|---|---|---|---|---|
| **SAPLING** | - 0 - | - 0 - | - 0 - | **53.49** |
| **POLE TIMBER** | 5.10 | 3.40 | 3.40 | **153.77** |
| **SMALL SAW TIMBER** | 0.62 | - 0 - | 0.62 | **22.64** |
| **LARGE SAW TIMBER** | - 0 - | 0.38 | - 0 - | **34.84** |
| **TOTAL** | **5.72** | **3.78** | **4.02** | **264.74** |

## TABLE # 5 - ESTIMATED BASAL AREA PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | - 0 - | 2.00 | 0.67 | - 0 - | - 0 - |
| **POLE TIMBER** | 5.99 | 5.99 | 28.00 | 2.00 | - 0 - | 4.00 |
| **SMALL SAW TIMBER** | 2.00 | 8.66 | 4.67 | 1.33 | 2.67 | 0.67 |
| **LARGE SAW TIMBER** | 26.01 | 34.68 | 8.01 | 6.01 | 8.00 | 0.67 |
| **TOTAL** | **34.00** | **49.33** | **42.68** | **10.01** | **10.67** | **5.34** |

| SPECIES | SFT. MAPLE | HD. MAPLE | SYCAMORE | CH. OAK | CUCUMBER | WH. ASH |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | - 0 - | - 0 - | - 0 - | - 0 - | - 0 - |
| **POLE TIMBER** | 4.00 | 0.67 | 2.67 | 0.67 | - 0 - | - 0 - |
| **SMALL SAW TIMBER** | 2.00 | 2.00 | 1.33 | - 0 - | 0.67 | - 0 - |
| **LARGE SAW TIMBER** | 2.01 | 2.00 | 0.67 | - 0 - | 0.67 | 0.67 |
| **TOTAL** | **8.01** | **4.67** | **4.67** | **0.67** | **1.34** | **0.67** |

| SPECIES | BL. BIRCH | BEECH | YEL. PINE | TOTAL |
|---|---|---|---|---|
| **SAPLING** | - 0 - | - 0 - | - 0 - | **2.67** |
| **POLE TIMBER** | 2.00 | 0.67 | 0.67 | **57.33** |
| **SMALL SAW TIMBER** | 0.67 | - 0 - | - 0 - | **26.67** |
| **LARGE SAW TIMBER** | - 0 - | 0.67 | 0.67 | **90.74** |
| **TOTAL** | **2.67** | **1.34** | **1.34** | **177.41** |

* YEL. PINE INCLUDES VA. PINE & PITCH PINE.

* VOLUME ESTIMATES ARE BASED ON A SYSTEMATIC PRISM CRUISE (10 BAF) OF 15 SAMPLE PLOTS.

## MANAGEMENT UNIT 6-B SUMMARY:

**LOCATION:** northeast of Route 33 & Management Unit 6-A; on the lower slopes of Feedstone Mountain

**ACREAGE:** 157 +/- acres of which all is forest land

**ACCESS:** fair; a steep bluff lies along the entire lower edge of unit adjacent to Management Unit 6-A & Dry River; only access into unit is by way of the entrance road to the police firing range, and the old Pendleton Turnpike, which parallels to Route 33, through Management Area 7-A & Management Area 6-B; between these units this road crosses a short section of U. S. Forest Service property; a new road to the communication tower leads off from this road & provides access to the upper portions of the unit

**TOPOGRAPHY:** steep, rocky, mountainous terrain; from the lower edge to the top of unit, a distance of approximately 0.7 miles, elevation changes about 1,000 feet, averaging around a 27 % slope

**SOILS:** in the lower area, approximately eighty percent of the acreage of the unit, the soils are Lehew, Dekalb, and Calvin, 45 to 65 percent slopes, very stony, map unit symbol 44F; in the upper area, approximately twenty percent of the acreage of the unit, the soils are Lehew, Dekalb, and Calvin, 25 to 45 percent slopes, very stony, map unit symbol 44E; soils on benches are good for growing trees, soils on ridges are poor for growing trees

**FOREST:** a relatively old, moderately stocked, forest stand, averaging 389 trees & 98 square feet of basal area per acre, with saw timber averaging over 3 thousand board feet per acre & pulpwood averaging over 12 cords per acre; total saw timber volume - 525 thousand board feet, primarily chestnut oak (114 thousand board feet), white oak (110 thousand board feet), and white pine (74 thousand board feet); total pulpwood volume - 1,896 cords; 26 merchantable saw timber trees per acre; very little tree reproduction; thick growth of mountain laurel in many areas

**COMMENTS:** unit is very steep and rocky, includes portions of three south to southwest facing hollows; with the exception of two sites, the timber growing sites on the unit are fairly poor; these two are a forest stand of predominantly large diameter white oaks located in the southwest corner of the unit & a forest stand of large diameter oaks of several species located near the communication tower, both of which could be managed primarily for mast production to benefit wildlife; are forest stands of mature yellow pine that probably won't live much longer & should be considered for harvesting & replanting; the existing road system will need to be changed to allow timber harvesting in the unit;

**RECOMENDATIONS:** 1) monitor gypsy moth population; 2) Communication Tower Road - install water control structures & establish a grass cover on the exposed soils along the road; 3) conduct timber harvests in the two oak stands, to open up the canopy, creating

room for the crowns of the residual trees to expand, stimulating mast production;  2) clear cut the yellow pine stands & replant

# MANAGEMENT UNIT 6 - B

TOWER HILL - MOUNTAIN LAND

**157 +/- ACRES OF WOODLAND**

# TIMBER CRUISE REPORT

**TABLE # 1 - ESTIMATED SAW TIMBER VOLUMES BY SPECIES & DIAMETER CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)**

| DBH | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY | SFT. MAPLE | HD. MAPLE |
|---|---|---|---|---|---|---|---|
| 14 | 13,738 | 5,369 | 3,187 | 12,827 | 4,270 | 0 | 0 |
| 16 | 10,645 | 0 | 11,995 | 10,079 | 0 | 4,443 | 4,443 |
| 18 | 7,191 | 4,537 | 0 | 17,003 | 9,075 | 0 | 0 |
| 20 | 7,410 | 0 | 0 | 17,396 | 0 | 0 | 0 |
| 22 | 16,265 | 0 | 20,457 | 15,653 | 0 | 0 | 0 |
| 24 | 8,933 | 9,593 | 15,700 | 19,185 | 0 | 0 | 0 |
| 26 | 0 | 8,588 | 0 | 4,883 | 0 | 0 | 0 |
| 28 | 10,205 | 7,458 | 0 | 0 | 0 | 0 | 0 |
| 30 + | 0 | 0 | 0 | 12,560 | 0 | 0 | 0 |
| **TOTAL** | **74,387** | **35,545** | **51,339** | **109,586** | **13,345** | **4,443** | **4,443** |

| DBH | BL. OAK | SCLT. OAK | CH. OAK | BL. BIRCH | YEL. PINE | TOTAL |
|---|---|---|---|---|---|---|
| 14 | 13,832 | 4,270 | 12,733 | 0 | 30,003 | **100,229** |
| 16 | 3,313 | 14,522 | 23,330 | 0 | 14,522 | **97,292** |
| 18 | 12,434 | 0 | 29,438 | 0 | 10,299 | **89,977** |
| 20 | 3,407 | 0 | 20,802 | 0 | 4,663 | **53,678** |
| 22 | 0 | 0 | 6,971 | 7,159 | 0 | **66,505** |
| 24 | 0 | 0 | 9,593 | 0 | 0 | **63,004** |
| 26 | 0 | 0 | 11,116 | 0 | 0 | **24,587** |
| 28 | 0 | 0 | 0 | 0 | 0 | **17,663** |
| 30 + | 0 | 0 | 0 | 0 | **0** | **12,560** |
| **TOTAL** | **32,986** | **18,792** | **113,983** | **7,159** | **59,487** | **525,495** |

**TABLE # 2 - ESTIMATED SAW TIMBER VOLUMES PER ACRE BY SPECIES & SIZE CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)**

| SPECIES | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY | SFT. MAPLE |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 155.3 | 34.2 | 96.7 | 145.9 | 27.2 | 28.3 |
| LARGE (18" DBH & UP) | 318.5 | 192.2 | 230.3 | 552.1 | 57.8 | - 0 - |
| **TOTAL** | **473.8** | **226.4** | **327.0** | **698.0** | **85.0** | **28.3** |

| SPECIES | HD. MAPLE | BL. OAK | SCLT. OAK | CH. OAK | BL. BIRCH | YEL. PINE |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 28.3 | 109.2 | 119.7 | 229.7 | - 0 - | 283.6 |
| LARGE (18" DBH & UP) | - 0 - | 100.9 | - 0 - | 496.3 | 45.6 | 95.3 |
| **TOTAL** | **28.3** | **210.1** | **119.7** | **726.0** | **45.6** | **378.9** |

| SPECIES | TOTAL |
|---|---|
| SMALL (14 - 16" DBH) | **1,258.1** |
| LARGE (18" DBH & UP) | **2,089.0** |
| **TOTAL** | **3,347.1** |

**TABLE # 3 - ESTIMATED PULPWOOD VOLUMES BY SPECIES: (IN WEIGHT CORDS)**

| SPECIES | VOLUME/ACRE | TOTAL VOLUME |
|---|---|---|
| WH. PINE | 0.35 | 55 |
| HEMLOCK | 0.23 | 36 |
| RD. OAK | 0.06 | 9 |
| WH. OAK | 0.68 | 107 |
| HICKORY | 0.50 | 78 |
| SFT. MAPLE | 0.97 | 152 |
| HD. MAPLE | 0.06 | 9 |
| BL. OAK | 0.69 | 108 |
| SCLT. OAK | 0.83 | 130 |
| CH. OAK | 4.33 | 680 |
| BL. BIRCH | 0.06 | 9 |
| MISC. HWDS. | 0.89 | 140 |
| YEL. PINE | 2.44 | 383 |
| TOTAL | 12.09 | 1,896 |

## TABLE # 4 - ESTIMATED NUMBER OF TREES PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY | SFT. MAPLE |
|---|---|---|---|---|---|---|
| **SAPLING** | 15.92 | 15.92 | - 0 - | 15.92 | 41.40 | 9.55 |
| **POLE TIMBER** | 7.60 | 4.20 | 0.51 | 4.98 | 6.15 | 22.62 |
| **SMALL SAW TIMBER** | 1.18 | 0.26 | 0.66 | 1.44 | 0.46 | 0.20 |
| **LARGE SAW TIMBER** | 0.65 | 0.48 | 0.68 | 2.10 | 0.31 | - 0 - |
| **TOTAL** | **25.35** | **20.86** | **1.85** | **24.44** | **48.32** | **32.37** |

| SPECIES | HD. MAPLE | BL. OAK | SCLT. OAK | CH. OAK | BL. BIRCH | MISC. HWDS. |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | - 0 - | 6.37 | 9.55 | - 0 - | 98.71 |
| **POLE TIMBER** | 0.80 | 8.03 | 7.87 | 35.18 | 1.42 | 3.73 |
| **SMALL SAW TIMBER** | 0.20 | 0.98 | 1.32 | 5.71 | - 0 - | - 0 - |
| **LARGE SAW TIMBER** | - 0 - | 0.60 | 0.29 | 4.42 | 0.11 | - 0 - |
| **TOTAL** | **1.00** | **9.61** | **15.85** | **54.86** | **1.53** | **102.44** |

| SPECIES | YEL. PINE | TOTAL |
|---|---|---|
| **SAPLING** | 22.29 | **235.63** |
| **POLE TIMBER** | 24.71 | **127.80** |
| **SMALL SAW TIMBER** | 3.14 | **15.55** |
| **LARGE SAW TIMBER** | 0.45 | **10.09** |
| **TOTAL** | **50.59** | **389.07** |

## TABLE # 5 - ESTIMATED BASAL AREA PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY | SFT. MAPLE |
|---|---|---|---|---|---|---|
| **SAPLING** | 1.39 | 0.56 | - 0 - | 0.56 | 1.95 | 0.83 |
| **POLE TIMBER** | 1.95 | 1.40 | 0.28 | 2.49 | 2.24 | 5.56 |
| **SMALL SAW TIMBER** | 1.39 | 0.28 | 0.84 | 1.67 | 0.56 | 0.28 |
| **LARGE SAW TIMBER** | 1.68 | 1.40 | 1.94 | 5.28 | 0.56 | - 0 - |
| **TOTAL** | **6.41** | **3.64** | **3.06** | **10.00** | **5.31** | **6.67** |

| SPECIES | HD. MAPLE | BL. OAK | SCLT. OAK | CH. OAK | BL. BIRCH | MISC. HWDS. |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | - 0 - | 0.56 | 0.83 | - 0 - | 3.62 |
| **POLE TIMBER** | 0.28 | 3.34 | 2.78 | 14.17 | 0.28 | 1.40 |
| **SMALL SAW TIMBER** | 0.28 | 1.11 | 1.67 | 6.94 | - 0 - | - 0 - |
| **LARGE SAW TIMBER** | - 0 - | 1.11 | 0.56 | 9.17 | 0.28 | - 0 - |
| **TOTAL** | **0.56** | **5.56** | **5.57** | **31.11** | **0.56** | **5.02** |

| SPECIES | YEL. PINE | TOTAL |
|---|---|---|
| **SAPLING** | 1.11 | **11.41** |
| **POLE TIMBER** | 9.44 | **45.61** |
| **SMALL SAW TIMBER** | 3.61 | **18.63** |
| **LARGE SAW TIMBER** | 0.84 | **22.82** |
| **TOTAL** | **15.00** | **98.47** |

* MISC. HWDS. INCLUDES BL. GUM, BASSWOOD & SASSAFRAS.

* YEL. PINE INCLUDES VA. PINE & PITCH PINE.

* VOLUME ESTIMATES ARE BASED ON A SYSTEMATIC PRISM CRUISE (10 BAF) OF 36 SAMPLE PLOTS.

## MANAGEMENT UNIT 7-A SUMMARY:

**LOCATION:** northeast side of Route 33, between Route 33 & the base of Feedstone Mountain

**ACREAGE:** 73 +/- acres of which all is forest land

**ACCESS:** excellent, police firing range road provides access to the unit

**TOPOGRAPHY:** relatively flat terrain, lies in the bottom land area; over the length of the unit, a distance of approximately 0.6 miles, elevation changes about 50 feet, averaging less than a 2 % slope

**SOILS:** typic udorthents, map unit symbol 70A, good for growing trees

**FOREST:** a relatively old, heavily stocked, mature forest stand, averaging 266 trees & 139 square feet of basal area per acre, with saw timber averaging almost 17 thousand board feet per acre & pulpwood averaging almost 8 cords per acre; total saw timber volume - 1.217 million board feet, primarily white pine (725 thousand board feet), yellow poplar (170 thousand board feet), and hemlock (89 thousand board feet), total pulpwood volume - 569 cords; 54 merchantable saw timber trees per acre; about 1/5 of merchantable trees on unit are hemlock; lack of adequate tree reproduction

**COMMENTS:** unit is gated & gets minimal public use

**RECOMENDATIONS:** 1) a forest stand having long term sustainability should be developed by implementing various silvicultural treatments that will vary species composition & stand structure, through a series of combined improvement, single tree & group selection cuttings

# MANAGEMENT UNIT 7 - A

POLICE FIRING RANGE - BOTTOM LAND

**73 +/- ACRES OF WOODLAND**

# TIMBER CRUISE REPORT

**TABLE # 1 - ESTIMATED SAW TIMBER VOLUMES BY SPECIES & DIAMETER CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)**

| DBH | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY | SFT. MAPLE |
|---|---|---|---|---|---|---|---|
| 14 | 17,031 | 50,246 | 11,921 | 0 | 6,935 | 3,971 | 0 |
| 16 | 19,425 | 106,259 | 14,600 | 3,081 | 9,366 | 3,081 | 7,220 |
| 18 | 22,856 | 84,556 | 16,914 | 0 | 6,285 | 6,285 | 6,285 |
| 20 | 23,564 | 48,954 | 31,390 | 0 | 4,336 | 0 | 9,855 |
| 22 | 46,924 | 79,409 | 7,665 | 5,636 | 12,286 | 7,665 | 0 |
| 24 | 7,176 | 102,076 | 6,731 | 7,709 | 5,679 | 0 | 0 |
| 26 | 6,125 | 81,840 | 0 | 0 | 4,541 | 0 | 0 |
| 28 | 18,046 | 108,449 | 0 | 0 | 0 | 0 | 0 |
| 30 + | 8,804 | 63,065 | 0 | 6,001 | 0 | 0 | 0 |
| **TOTAL** | **169,951** | **724,854** | **89,221** | **22,427** | **49,428** | **21,002** | **23,360** |

| DBH | BL. OAK | SYCAMORE | SCLT. OAK | CH. OAK | MISC. HWDS. | YEL. PINE | TOTAL |
|---|---|---|---|---|---|---|---|
| 14 | 8,964 | 4,139 | 0 | 0 | 0 | 2,964 | **106,171** |
| 16 | 18,739 | 0 | 0 | 0 | 0 | 0 | **181,771** |
| 18 | 19,141 | 5,519 | 0 | 0 | 4,219 | 18,856 | **190,916** |
| 20 | 10,789 | 0 | 6,446 | 3,161 | 0 | 0 | **138,495** |
| 22 | 0 | 0 | 0 | 4,460 | 0 | 0 | **164,045** |
| 24 | 0 | 0 | 0 | 4,460 | 0 | 0 | **133,831** |
| 26 | 0 | 0 | 4,541 | 0 | 0 | 0 | **97,047** |
| 28 | 0 | 0 | 0 | 0 | 0 | 0 | **126,495** |
| 30 + | 0 | 0 | 0 | 0 | 0 | **0** | **77,870** |
| **TOTAL** | **57,633** | **9,658** | **10,987** | **12,081** | **4,219** | **21,820** | **1,216,641** |

**TABLE # 2 - ESTIMATED SAW TIMBER VOLUMES PER ACRE BY SPECIES & SIZE CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)**

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 499.4 | 2,143.9 | 363.3 | 42.2 | 223.3 | 96.6 |
| LARGE (18" DBH & UP) | 1,828.7 | 7,785.6 | 858.9 | 265.0 | 453.8 | 191.1 |
| **TOTAL** | **2,328.1** | **9,929.5** | **1,222.2** | **307.2** | **677.1** | **287.7** |

| SPECIES | SFT. MAPLE | BL. OAK | SYCAMORE | SCLT. OAK | CH. OAK | MISC. HWDS. |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | 98.9 | 379.5 | 56.7 | - 0 - | - 0 - | - 0 - |
| LARGE (18" DBH & UP) | 221.1 | 410.0 | 75.6 | 150.5 | 165.5 | 57.8 |
| **TOTAL** | **320.0** | **789.5** | **132.3** | **150.5** | **165.5** | **57.8** |

| SPECIES | YEL. PINE | TOTAL |
|---|---|---|
| SMALL (14 - 16" DBH) | 40.6 | **3,944.4** |
| LARGE (18" DBH & UP) | 258.3 | **12,721.9** |
| **TOTAL** | **298.9** | **16,666.3** |

**TABLE # 3 - ESTIMATED PULPWOOD VOLUMES BY SPECIES: (IN WEIGHT CORDS)**

| SPECIES | VOLUME/ACRE | TOTAL VOLUME |
|---|---|---|
| YEL. POPLAR | 0.28 | 20 |
| WH. PINE | 2.03 | 148 |
| HEMLOCK | 1.88 | 137 |
| WH. OAK | 0.13 | 9 |
| HICKORY | 0.94 | 69 |
| SFT. MAPLE | 1.24 | 91 |
| BL. OAK | 0.55 | 40 |
| SYCAMORE | 0.13 | 9 |
| CH. OAK | 0.21 | 15 |
| MISC. HWDS. | 0.26 | 19 |
| YEL. PINE | 0.16 | 12 |
| TOTAL | 7.81 | 569 |

## TABLE # 4 - ESTIMATED NUMBER OF TREES PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | 63.70 | 6.37 | - 0 - | - 0 - | 12.74 |
| **POLE TIMBER** | 4.42 | 17.64 | 17.43 | - 0 - | 1.02 | 9.51 |
| **SMALL SAW TIMBER** | 3.27 | 11.56 | 2.75 | 0.40 | 1.84 | 0.92 |
| **LARGE SAW TIMBER** | 3.65 | 11.84 | 3.18 | 0.66 | 1.32 | 0.52 |
| **TOTAL** | **11.34** | **104.74** | **29.73** | **1.06** | **4.18** | **23.69** |

| SPECIES | SFT. MAPLE | BL. OAK | SYCAMORE | SCLT. OAK | CH. OAK | MISC. HWDS. |
|---|---|---|---|---|---|---|
| **SAPLING** | 6.37 | - 0 - | - 0 - | - 0 - | - 0 - | 44.58 |
| **POLE TIMBER** | 10.00 | 2.12 | 2.83 | - 0 - | 3.54 | 9.38 |
| **SMALL SAW TIMBER** | 1.71 | 3.03 | 0.40 | - 0 - | - 0 - | 0.52 |
| **LARGE SAW TIMBER** | 1.07 | 1.77 | 0.26 | 0.41 | 0.65 | 0.31 |
| **TOTAL** | **19.15** | **6.92** | **3.49** | **0.41** | **4.19** | **54.79** |

| SPECIES | YEL. PINE | TOTAL |
|---|---|---|
| **SAPLING** | - 0 - | **133.76** |
| **POLE TIMBER** | 0.71 | **78.60** |
| **SMALL SAW TIMBER** | 0.52 | **26.92** |
| **LARGE SAW TIMBER** | 0.94 | **26.58** |
| **TOTAL** | **2.17** | **265.86** |

## TABLE # 5 - ESTIMATED BASAL AREA PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | RD. OAK | WH. OAK | HICKORY |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | 2.22 | 0.56 | - 0 - | - 0 - | 1.11 |
| **POLE TIMBER** | 1.12 | 7.23 | 7.78 | - 0 - | 0.56 | 3.89 |
| **SMALL SAW TIMBER** | 3.89 | 14.45 | 3.34 | 0.56 | 2.22 | 1.12 |
| **LARGE SAW TIMBER** | 9.46 | 33.88 | 6.67 | 2.23 | 3.35 | 1.12 |
| **TOTAL** | **14.47** | **57.78** | **18.35** | **2.79** | **6.13** | **7.24** |

| SPECIES | SFT. MAPLE | BL. OAK | SYCAMORE | SCLT. OAK | CH. OAK | MISC. HWDS. |
|---|---|---|---|---|---|---|
| **SAPLING** | 0.56 | - 0 - | - 0 - | - 0 - | - 0 - | 2.23 |
| **POLE TIMBER** | 3.34 | 1.67 | 0.56 | - 0 - | 1.12 | 3.35 |
| **SMALL SAW TIMBER** | 2.23 | 3.89 | 0.56 | - 0 - | - 0 - | 0.56 |
| **LARGE SAW TIMBER** | 2.23 | 3.33 | 0.56 | 1.12 | 1.68 | 0.56 |
| **TOTAL** | **8.36** | **8.89** | **1.68** | **1.12** | **2.80** | **6.70** |

| SPECIES | YEL. PINE | TOTAL |
|---|---|---|
| **SAPLING** | - 0 - | **6.68** |
| **POLE TIMBER** | 0.56 | **31.18** |
| **SMALL SAW TIMBER** | 0.56 | **33.38** |
| **LARGE SAW TIMBER** | 1.67 | **67.86** |
| **TOTAL** | **2.79** | **139.10** |

* MISC. HWDS. INCLUDES BL. GUM, BL. BIRCH, HD. MAPLE, PERSIMMON & HORNBEAM.

* YEL. PINE INCLUDES VA. PINE & PITCH PINE.

* VOLUME ESTIMATES ARE BASED ON A SYSTEMATIC PRISM CRUISE (10 BAF) OF 18 SAMPLE PLOTS.

## MANAGEMENT UNIT 7-B SUMMARY:

**LOCATION:** northeast of Route 33 & Management Unit 7-A, on the lower slope of two spur ridges, Peach Ridge & an unnamed ridge, off the south side of Feedstone Mountain

**ACREAGE:** 62 +/- acres of which all is forest land

**ACCESS:** poor, presently no roads into or on the unit; a road on Management Unit 7-A comes close to lower edge of the western section of the unit, a new road branching from this road could provide access into this area

**TOPOGRAPHY:** steep, rocky, mountainous terrain; from the bottom of the unit to the top, a distance of approximately 0.2 miles, elevation changes about 440 feet, averaging around a 37 % slope

**SOILS:** Lehew, Dekalb, and Calvin soils, 45 to 65 percent slopes, very stony, map unit symbol 44F, soils are poor for growing trees

**FOREST:** a relatively old, fully stocked, forest stand, averaging 544 trees & 106 square feet of basal area per acre, with saw timber averaging over 4 thousand board feet per acre & pulpwood averaging over 12 cords per acre; total saw timber volume - 273 thousand board feet, primarily white pine (92 thousand board feet), scarlet oak (53 thousand board feet), and yellow pine (44 thousand board feet); total pulpwood volume - 749 cords; 31 merchantable saw timber trees per acre; lack of adequate tree reproduction; thick growth of mountain laurel in many areas; all timber growing sites are fairly poor

**COMMENTS:** unit gets minimal public use, not very interesting from a timber management perspective

**RECOMENDATIONS:** 1) monitor gypsy moth population

# MANAGEMENT UNIT 7 - B

POLICE FIRING RANGE - MOUNTAIN LAND

**62 +/- ACRES OF WOODLAND**

# TIMBER CRUISE REPORT

**TABLE # 1 - ESTIMATED SAW TIMBER VOLUMES BY SPECIES & DIAMETER CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)**

| DBH | YEL. POPLAR | WH. PINE | HEMLOCK | WH. OAK | BL. OAK | SCLT. OAK | HICKORY |
|---|---|---|---|---|---|---|---|
| 14 | 0 | 13,256 | 0 | 3,794 | 3,794 | 11,396 | 0 |
| 16 | 0 | 21,855 | 2,945 | 4,997 | 0 | 11,854 | 0 |
| 18 | 6,392 | 25,575 | 4,030 | 0 | 6,008 | 17,124 | 4,030 |
| 20 | 0 | 4,414 | 0 | 4,148 | 0 | 8,296 | 0 |
| 22 | 0 | 7,750 | 0 | 5,388 | 0 | 4,266 | 0 |
| 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 | 0 | 9,802 | 0 | 0 | 0 | 0 | 0 |
| 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 + | 0 | 9,337 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | **6,392** | **91,989** | **6,975** | **18,327** | **9,802** | **52,936** | **4,030** |

| DBH | SFT. MAPLE | CH. OAK | YEL. PINE | TOTAL |
|---|---|---|---|---|
| 14 | 7,595 | 0 | 21,898 | **61,733** |
| 16 | 0 | 8,835 | 11,625 | **62,111** |
| 18 | 0 | 18,054 | 11,123 | **92,336** |
| 20 | 0 | 0 | 0 | **16,858** |
| 22 | 0 | 3,100 | 0 | **20,504** |
| 24 | 0 | 0 | 0 | **0** |
| 26 | 0 | 0 | 0 | **9,802** |
| 28 | 0 | 0 | 0 | **0** |
| 30 + | 0 | 0 | 0 | **9,337** |
| **TOTAL** | **7,595** | **29,989** | **44,646** | **272,681** |

**TABLE # 2 - ESTIMATED SAW TIMBER VOLUMES PER ACRE BY SPECIES & SIZE CLASS: (IN BOARD FEET - INTERNATIONAL 1/4" LOG RULE)**

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | WH. OAK | BL. OAK | SCLT. OAK |
|---|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | - 0 - | 566.3 | 47.5 | 141.8 | 61.2 | 375.0 |
| LARGE (18" DBH & UP) | 103.1 | 917.4 | 65.0 | 153.8 | 96.9 | 478.8 |
| **TOTAL** | **103.1** | **1,483.7** | **112.5** | **295.6** | **158.1** | **853.8** |

| SPECIES | HICKORY | SFT. MAPLE | CH. OAK | YEL. PINE | TOTAL |
|---|---|---|---|---|---|
| SMALL (14 - 16" DBH) | - 0 - | 122.5 | 142.5 | 353.2 | **1,810.0** |
| LARGE (18" DBH & UP) | 65.0 | - 0 - | 341.2 | 366.9 | **2,588.1** |
| **TOTAL** | **65.0** | **122.5** | **483.7** | **720.1** | **4,398.1** |

**TABLE # 3 - ESTIMATED PULPWOOD VOLUMES BY SPECIES: (IN WEIGHT CORDS)**

| SPECIES | VOLUME/ACRE | TOTAL VOLUME |
|---|---|---|
| WH. PINE | 1.02 | 63 |
| HEMLOCK | 0.38 | 24 |
| WH. OAK | 1.53 | 95 |
| BL. OAK | 0.43 | 27 |
| SCLT. OAK | 0.93 | 58 |
| HICKORY | 0.15 | 9 |
| SFT. MAPLE | 1.22 | 76 |
| CH. OAK | 3.04 | 188 |
| MISC. HWDS. | 0.31 | 19 |
| YEL. PINE | 3.07 | 190 |
| TOTAL | 12.08 | 749 |

## TABLE # 4 - ESTIMATED NUMBER OF TREES PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | WH. OAK | BL. OAK | SCLT. OAK |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | 78.81 | - 0 - | 14.33 | - 0 - | 28.66 |
| **POLE TIMBER** | - 0 - | 10.00 | 3.09 | 18.80 | 8.32 | 11.34 |
| **SMALL SAW TIMBER** | - 0 - | 3.55 | 0.45 | 1.03 | 0.58 | 3.10 |
| **LARGE SAW TIMBER** | 0.35 | 2.26 | 0.35 | 0.81 | 0.35 | 1.87 |
| **TOTAL** | **0.35** | **94.62** | **3.89** | **34.97** | **9.25** | **44.97** |

| SPECIES | HICKORY | SFT. MAPLE | CH. OAK | MISC. HWDS. | YEL. PINE | TOTAL |
|---|---|---|---|---|---|---|
| **SAPLING** | 35.82 | 57.32 | - 0 - | 171.98 | - 0 - | **386.92** |
| **POLE TIMBER** | 1.79 | 13.78 | 21.79 | 7.51 | 29.65 | **126.07** |
| **SMALL SAW TIMBER** | - 0 - | 1.17 | 5.44 | - 0 - | 4.41 | **19.73** |
| **LARGE SAW TIMBER** | 0.35 | - 0 - | 4.07 | - 0 - | 0.71 | **11.12** |
| **TOTAL** | **37.96** | **72.27** | **31.30** | **179.49** | **34.77** | **543.84** |

## TABLE # 5 - ESTIMATED BASAL AREA PER ACRE BY SPECIES & SIZE CLASS:

| SPECIES | YEL. POPLAR | WH. PINE | HEMLOCK | WH. OAK | BL. OAK | SCLT. OAK |
|---|---|---|---|---|---|---|
| **SAPLING** | - 0 - | 3.13 | - 0 - | 1.25 | - 0 - | 0.62 |
| **POLE TIMBER** | - 0 - | 4.37 | 1.87 | 6.26 | 2.49 | 4.37 |
| **SMALL SAW TIMBER** | - 0 - | 4.38 | 0.62 | 1.24 | 0.62 | 3.76 |
| **LARGE SAW TIMBER** | 0.62 | 4.98 | 0.62 | 1.87 | 0.62 | 3.75 |
| **TOTAL** | **0.62** | **16.86** | **3.11** | **10.62** | **3.73** | **12.50** |

| SPECIES | HICKORY | SFT. MAPLE | CH. OAK | MISC. HWDS. | YEL. PINE | TOTAL |
|---|---|---|---|---|---|---|
| **SAPLING** | 1.24 | 3.12 | - 0 - | 3.75 | - 0 - | **13.11** |
| **POLE TIMBER** | 0.62 | 5.00 | 9.38 | 1.86 | 11.87 | **48.09** |
| **SMALL SAW TIMBER** | - 0 - | 1.25 | 6.26 | - 0 - | 5.00 | **23.13** |
| **LARGE SAW TIMBER** | 0.62 | - 0 - | 7.49 | - 0 - | 1.25 | **21.82** |
| **TOTAL** | **2.48** | **9.37** | **23.13** | **5.61** | **18.12** | **106.15** |

* MISC. HWDS. INCLUDES BL. GUM & SASSAFRAS.

* YEL. PINE INCLUDES VA. PINE & PITCH PINE.

* VOLUME ESTIMATES ARE BASED ON A SYSTEMATIC PRISM CRUISE (10 BAF) OF 16 SAMPLE PLOTS.